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A Comparison of Andragogy and Pedagogy: Assessing the Relationship Between Individual Personality Differences, Learning Styles, and Training Types

Richard A. Cartor
University of Tennessee

To the Graduate Council:

I am submitting herewith a dissertation written by Richard A. Cartor entitled "A Comparison of Andragogy and Pedagogy: Assessing the Relationship Between Individual Personality Differences, Learning Styles, and Training Types." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Industrial and Organizational Psychology.

Michael Rush, Major Professor

We have read this dissertation and recommend its acceptance:

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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We have read the dissertation
and recommend its acceptance:

Joyce E.A. Russell

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A COMPARISON OF ANDRAGOGY AND PEDAGOGY: ASSESSING THE RELATIONSHIP BETWEEN INDIVIDUAL PERSONALITY DIFFERENCES, LEARNING STYLES, AND TRAINING TYPES

A Dissertation
Presented for the Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Richard A. Cartor
December, 1990

DEDICATION

This project is dedicated to my family.
To my parents, Len and Joanne,
to my siblings, their spouses, and kids,
Lenny and Shirlee,
Tom and Gerry,
Marie, Bill, Jason and Justin,
and especially to my wife, Pamela.

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ABSTRACT

This study addresses issues related to the education and training of adults. In the past, adult education theorists and practitioners have generally prescribed that all adult learners would learn more and have more favorable responses to collaborative, participative types of training. While the strict dichotomization of learners based solely on their chronological age has recently been de-emphasized, there still remains a lack of clarity regarding which training types to use with adult learners.

The study addresses the fact that the theory and practices of andragogy, or adult learning theory, were derived primarily from non-traditional age college students. Non-traditional age college students are adults who have returned to college in continuing education programs. The point is made that the theories and principles may not generalize from voluntary adult learning situations to training programs in industry, where the training is often times mandatory.

It was proposed that learning styles, achievement levels, locus of control, and ego development levels would need to be assessed in order to determine the most advantageous training style for individuals. These were assessed by using The Learning Style Inventory (Kolb, 1981), The California Psychological Inventory (Gough, 1957), The Locus of Control Scale (Rotter, 1966), and The Measure of Ego Development (Loevinger, 1976). Scores on

these measures were then compared with three outcome variables after exposure to either lecture-style training (pedagogy), or participative training (andragogy). The three outcome variables which were assessed were the amount of objective learning as measured by performance on a post-test, satisfaction, and self-reported learning. It was hypothesized that for reflective learners, pedagogy would have more favorable outcomes, and for active learners, andragogy would have more favorable outcomes. Also, it was hypothesized that individuals with the active learning styles would demonstrate a more internal locus of control, have higher Achievement-Independent scores, have lower Achievement-Conformance scores, and have higher levels of ego development. It was proposed that it was this group, the active learners, that the principles and theories of andragogy were based upon.

Subjects for this study were 213 supervisors at a large government agency, who were attending a mandatory training program. The analysis of the data indicated that none of the hypotheses tested were statistically significant. Additional data analyses revealed an important influence of age, Achievement-Independence scores, and ego development scores on the measure of Objective Learning. The implications of these findings are discussed, and a model for understanding the andragogy-pedagogy relationship is presented. The model is presented, for use by both researchers and practitioners, as a rudimentary starting point for the development of an understanding of the relationship between the characteristics of the learner, and the appropriate behaviors of the trainer, teacher, or facilitator.

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CHAPTER I

INTRODUCTION

In the past, proponents of andragogy, or adult learning theory, have claimed that adults learn differently than children, and should therefore be trained differently. More recently, these proponents have adopted the perspective that certain individuals, regardless of their chronological age, will benefit from the more participative, collaborative type of training than the more unidirectional, pedagogical types of training. There are tremendous implications for the field of training and development if individuals' preferred learning styles influence the effectiveness of the type of training to which they are exposed. Since the field of training and development is concerned with effectively bringing about permanent changes in the knowledge, skills, or attitudes of adults in the workforce (Campbell, Dunnette, Lawler, and Weick, 1970), it seems important that researchers in the field determine whether different individuals do, in fact, benefit more from certain types of training formats, and it seems equally important that researchers and practitioners develop methods for determining when, and for whom, the various methods of training will be most effective.

By establishing relationships between individual personality differences and preferred learning styles, it may be possible to refine and clarify when the procedural prescriptions endorsed

by the advocates of andragogy can be appropriately applied. It may be possible to develop methods that would enable practitioners to determine when the different types of training are most appropriate. As Noe (1986) noted, "Determining the specific individual characteristics that influence the effectiveness of training is of utmost importance in order to understand how to increase the likelihood that behavior change and performance improvement will result from participation in training programs" (p.498). The perspective that will be developed is that particular individual personality differences are likely to be related to preferred learning styles, and preferred learning styles will be related to both the effectiveness and the perceived favorability of particular types of training.

Several factors, when considered together, illustrate the importance of refining a theory of adult learning. First, the population of America is aging. Trends in Census Bureau statistics (U. S. Bureau of Census, 1981) indicate that the increase in the average life span, along with the aging of the "baby boomers", and a decrease in the birthrate, will result in an older America. Cetron, Soriano and Gayle (1985) project that the median age will be rising from 30.6 in 1982 to 36.3 in the year 2000. By the year 2030, the median age of America will be 37.3, or almost 9 years higher than it was in 1980 (Rauch, 1981). Also, the portion of the U.S. population which will show the greatest increase will be the primary work ages of 30 to 59. These factors, along with the repeal of mandatory retirement and decreased mortality rates will likely create a workforce in the near future with a radically different age structure. Given

these demographic trends, it seems increasingly important to determine the role of chronological age in the effectiveness of educational programs.

Also, according to the U.S. Bureau of Census (1981), the workforce has undergone a radical change in its educational makeup. For persons age 16 and over, the percentage of high school graduates increased from 59% in 1950 to 80% in 1980. Similarly, for the same period, the percentage of college graduates increased from almost 15% to over 25%. Boyer (1986), in the Carnegie Foundation report on education, estimates that between now and 1990 there will be 12 to 13 million jobs for the approximately 15 million baccalaureate earners. It is predicted that by the year 2000 much more of the labor force will possess a college degree (Fay, McCune, and Begin, 1987). The consequences of such changes in the workforce could be great. Dawson (1983) pointed out that career plateauing will likely become an increasing problem as more and more qualified people compete for the same number of advanced positions. The inflexible structure of many organizations could limit many individuals opportunities for advancement.

Along with career limitations brought about by the sheer numbers of individuals in the workforce, and the concommitant competition for positions, the individual worker faces rapid changes in the technology that permeates every sector of society. The pace of change and the impact of global competition will result in frequent changes in jobs and careers for most workers, making retraining a necessity (Choate, 1984). This, however, is not necessarily a new observation. In 1964, for instance,

Hallenbeck noted the rapid advancement of technology when he stated that "...an individual entering industry today will experience one complete technological revolution in his own industry before he retires" (Hallenbeck, 1964). Previously, Mead had noted "...the most vivid truth of the new age: no one will live all his life in the world into which he was born, and no one will die in the the world in which he worked in his maturity" (Mead, 1957). Toffler (1976) went even further in addressing the issue of change and technological advancement when he pointed out that not only were changes occurring, but changes and complete technological revolutions were occurring at increasingly rapid rates. "Future shock" (or "too much change too fast"), for Toffler was seen as an indisputable characteristic of modern society, one that requires the individual to become "...infinitely more adaptable and capable than ever before" (p.35, 1976).

An important implication of such rapid growth and technological change is that knowledge and skills acquired at an earlier time quickly become obsolete. In an effort to counter the obsolescence of knowledge, Mead (1957) stressed the importance of lifelong learning, and pointed out that no longer could a person "complete" an education. Havighurst (1962), addressing the same point, says that "In the twentieth century world, the ordinary person has to learn more new things after the age of 20 than ever before in human history". Whitehead (1930) noted that for the first time in the history of the human race, the time span of major cultural change is considerably

shorter than the life span of the individuals in the society. That being the case, the simple transmission of existing knowledge to the student is an inadequate practice. Rather, the student must be prepared for a lifelong process of inquiry. Similarly, Toffler (1976) advocated "pre-adaptive" learning, or teaching individuals to inquire, to seek information, to cope with problems, and to find answers to their own questions as they occur throughout their lives.

Several factors point towards the need for lifelong learning. Almost 30 years ago the rapid progress of technology was noted, and is unlikely that the rate of change has slowed since that time. In fact, some (e.g., Toffler, 1976) claim that the rate of change will continue to increase and therefore the rate at which information becomes obsolete is also increasing. Also, the view that the American workforce is aging is well documented (Weinstock,1978; Rauch,1981; Dawson,1983; Cetron, Soriano and Gayle 1985). This, in addition to a generally more educated workforce creates a scenario of increased competition for existing jobs. Workers will compete with better educated persons in order to get jobs, and will face the necessity of lifelong learning to retain the jobs that they do acquire. The conclusion to be drawn then, is that more and more adults will need to return to, or continue, educational programs to help them maintain or advance in their careers.

CHAPTER II

REVIEW OF THE LITERATURE

1. Adult Education

Since the 1920's America has been increasingly concerned with adult learning and adult education (Jensen, Liveright, and Hallenbeck, 1964). In reviewing the tradition of adult education in the U.S., two streams of inquiry became evident. The first theme, exemplified by Thorndike's (1926) investigations of the adults capacity and ability to learn, was primarily laboratory work, and theoretical in nature. Lindemann (1926), working in a more applied setting, has been credited with being one of the earliest advocates of formal adult education (cf. Knowles, 1978). Lindemann's (1926) work, in which he explored the methods with which adult education could become more effective, represents the second stream of inquiry in regards to adult education, a stream which is more germane to the purpose of this review.

The enrollment in voluntary adult education programs at the college level, which had been growing steadily since the initial rapid growth of the early 1920's, has increased significantly in the recent past, from an estimated 8.2 million in 1957 to 17.1 million in 1975 (Rauch, 1981). That represents an increase from 7.6 percent of the population over the age of 25, to

11.6 percent of the same population. Also, according to the U.S. Department of Labor Bureau of Statistics (1981), the number of full time employees and teachers in the field of adult education was expected to rise from approximately 69,000 in 1975 to 100,000 by 1985.

Researchers have become interested in finding out why adults participate in voluntary adult education programs. Glenn and Weaver (1982a, 1982b) found that most people report a belief that increased educational attainment will ultimately result in increased job satisfaction. Houle (1961, 1982) also investigated why adults participate in adult education courses. By factor analyzing students responses, he found that three themes emerged. Adults reported participating for (1) goal oriented reasons, (2) activity oriented reasons, or (3) for the desire to learn for learning sake. A significant majority of the responses were grouped into the first category. A factor analysis conducted by Burgess (1981) replicated these findings. Similarly, in a survey conducted by the National Center for Education Statistics (1980), the most frequently cited reasons for attending courses are job related. Approximately thirty-nine percent (38.9%) of the respondents reported taking courses for job improvement or advancement, 10.5 percent in order to get a new job, and 3.3 percent reported other job related reasons. Other researchers, such as Tough (1978), Cross (1979, 1981), Carp, Peterson, and Roelfs (1974), The 1972 Gallup Pole, and Boyer (1986) have reported similar pragmatic motivations on the part of adult students.

To this point, several related ideas have been addressed. In quick review: Society is becoming more complex and technologically advanced. To meet the demands of the marketplace, to compete with more job eligible people and a more highly educated salariat; to attain, maintain, or advance in their chosen occupation, adults are, in increasing numbers, seeking to advance their educations. This tremendous influx of adults into the educational system which had previously dealt predominately with only students under the age of about 21, raised important philosophical and theoretical issues. One important question that needed to be addressed was, "Do these new students, the adult learners, learn differently than children?"

2. The Case for Andragogy

Initially, proponents of andragogy contended that the way adults learn is different than the way in which children learn, and that educating adults, therefore requires a different process than educating children (cf., Knowles, 1970, 1978, 1980; Cross, 1979, 1981; Kidd, 1973, 1974, 1977; Carlson, 1979; Ingalls and Aceri, 1972; Laird, 1978; Gross, 1982; McKenzie, 1977, 1979;) Later, Malcolm Knowles (1984), considered the major advocate and proponent of andragogy, de-emphasized the critical role of chronological age in determining effective styles of education. It is important to note that concessions have been made that in some instances pedagogical methods may be more effective than

andragogical methods when training adults, and andragogical methods may be more effective than pedagogical methods when training children.

The labels attached to the different methods of educating students are "pedagogy" and "andragogy". The etymologies of the respective words point out the different nature of the methods. Pedagogy comes from the Latin words "paid", meaning "child", and "agogus" , meaning "leader of". Literally, pedagogy refers to the art and science of leading children. Andragogy, on the other hand, comes from the Latin "aner", meaning "man" (as opposed to child), and therefore refers to the method of leading adults.

The belief that adults learn differently than children is by no means a new idea. Knowles (1978) states that the inquiry method of teaching adults was employed by such notable historic figures as Socrates, Jesus Christ, and Lao-Tse. However, once schooling became organized and formally structured, the pedagogic method became the dominant method in education.

Knowles (1980) traces the advent of pedagogical methods to around the tenth century when monks in monastaries taught very young children relatively simple tasks. These methods spread throughout the world when it became common for missionaries to educate elementary age school children. The critical elements, Knowles points out, was that young children were being taught a relatively fixed body of knowledge. When the pedagogical methods were applied to adults returning to academia, which became increasingly common around the 1920's, the results were less than successful. Knowles blamed

the early high dropout rate of adults on the violation of the basic assumptions in the application of pedagogy. That is, the methods were intended for use with children, and the idea of a fixed, stable body of knowledge was inaccurate when dealing with the needs of the 20th century adult learner. The adults were being taught as if they were children, and the methods were ineffective.

The Journal of Adult Education, over roughly a 20 year period, published a series of articles on effective methods of educating the returning adult learner (cf., Leigh, 1930; Mackaye, 1931; Jackson, 1931; Russell, 1938; Rogers, 1938; Wiese, 1939; Thomas, 1939; Fields, 1940) . Also, Lindemann's (1926) seminal work, The Meaning of Adult Education explored various successful methods used in adult education. Deviations from the standard pedagogical methods of rote memorization, lectures, and examinations, were common. Some examples of the "new" techniques included group discussions, applied problem solving sessions, joint goal setting, interviews instead of quizzes, and learning contracts. These methods, all examples of andragogic techniques, had not yet been organized into a unified theory, or labelled as "andragogy". It wasn't until 1968 that Knowles introduced the label for the first time to American readers. (The use of the term can be traced back through various European countries, and was used by various individuals. Most accounts agree that the term was used first in 1833 by Alexander Kapp, a grammar school teacher in Germany.)

3. Assumptions in Andragogy

Knowles (1980) pointed out four main assumptions which differentiate the models of andragogy and pedagogy. The first assumption regards the learner. In pedagogy the learner is seen as dependent and directed by the teacher. In andragogy, the learner is perceived as being more self-directed and independent. The second assumption deals with the role of experience. In pedagogy, the student is seen as having a limited reservoir of life experiences, and the experiences that the student does bring to the learning situation are treated as unimportant. In andragogy, the importance of the students life experiences is emphasized, and the instructor is encouraged to not ignore this source of knowledge. To deny the importance of the students experience is to discredit the student. In andragogy, the student is seen as bringing to the learning situation a specific readiness to learn. This readiness to learn, inspired by some experienced need in their lives, is another differing assumption between pedagogy and andragogy. On the other hand, in pedagogy, the students are seen as ready to learn anything that the instructor determines that they should learn, and pressure will be applied to motivate the students to learn the prescribed material. Finally, the two models have different assumptions regarding the students orientation to learning. In pedagogy, the learner sees education as the process of acquiring information that will be useful at some undefined later date. The orientation is subject-centered in that the curriculum is split

into separate subject matter compartments. In andragogy, the learner is seen as wanting to apply whatever they learn today to tomorrows real-life situation. Therefore, the learning experience should be organized around the development of immediately useful skills and competencies.

To summarize, there are four primary ways in which the assumptions of andragogy are different from the assumptions on which pedagogy is based. Knowles (1970) put it this way:

> These assumptions are that as the individuals mature: 1) their self-concept moves from one of being a dependent personality toward being a self-directed human being; 2) they accumulate a growing reservoir of experience that becomes an increasingly rich resource for learning; 3) their readiness to learn becomes oriented increasingly to the developmental tasks of their social roles; and 4) their time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly, their orientation towards learning shifts from one of subject-centeredness to one of performance-centeredness (p.39)

4. Implications for Practice

Knowles (1980) contends that each of the assumptions made in the method of andragogy bear implications for teaching practices. The implications of the assumptions listed above will now be addressed.

The adults self-concept, characterized by a sense of increasing independence and self-directedness, suggests an informal, mature atmosphere, one of mutual respect, support,

and friendliness. The instructor is encouraged to convey an interest in each individual student, and to actively listen to what the students have to say. The students self-directed nature also suggests a self-diagnosis of needs. In andragogy, it is assumed that the student can conduct an evaluation of the gap between desired competancies, and the current level of abilities. That is, the student experiencing inadequacies, can determine his or her own individual needs, and can set out a course of self-improvement. Following from this, the student actively participates in the process of planning the courses direction. A simple imposition of the will of the instructor violates the students sense of self-directedness, and therefore mutual participation in planning is encouraged. The instructors role also changes. In pedagogy, the teacher teaches, and takes full responsibility for the learning process. In andragogy, the responsibility for learning is shared by the instructor and the individual student. Rather than being considered "one who teaches", the teachers role in andragogy "...is redefined as that of a procedural technician, resource person, and co-inquirer; he is more a catalyst than an instructor, more a guide than a wizard" (Knowles, 1970, p.43). The roles also change in regards to student evaluations. Rather than assigning grades, or passing judgement on the other adults, which would offend their sense of self-directedness, the adult educator adopts a system of self-evaluations. These self-evaluations are re-diagnoses of the students learning needs. Progress is measured by comparing the current level of learning needs to the previous assessment of learning needs.

To summarize, the adults increasing sense of self-direction and independence has implications for practice. Andragogy provides prescriptions for the learning climate, the diagnosis of educational needs, the planning process, the roles played by "the teacher" and "the student", and for the evaluation of performance.

Prescriptions for practice also result from the assumptions made regarding the adults experience. Since the experience of the student is treated as a valuable source of knowledge, practices must be employed which build on this source. Andragogical practices rely on experiential techniques, emphasizing the use of active experimentation and concrete experiences. Such participatory educational techniques include "...group discussions, the case method, the critical-incident process, simulation exercises, role playing, skill-practice exercises, field projects, action projects, lab methods, consultive supervision, demonstration seminars, work conferences, counseling, group therapy, and community development." (Knowles, 1969, p. 44). These techniques, which are more student-involving than the pedagogical lecture method, are encouraged because of the belief that a more active learner is probably learning more. Also, andragogy emphasizes practical application. Teachers of adults should lead the students from broad theoretical generalizations to the actual application of principles in their everyday lives. That is, students should be able to see how to apply and practice what they're learning.

Two implications for practice arise from the assumptions

about the adults readiness to learn. The first rests on the idea of "teachable moments". Havighurst (1961) noted that individuals progress through certain developmental stages, and that each stage has accompanying developmental tasks. These developmental tasks produce a readiness to learn which peaks in "teachable moments." The teachable moments are times at which the individual is particularly receptive to learning relevant knowledge or skills. As the adult passes through stages, various learning tasks become more salient. Knowles (1970) suggests that the implication for practice is that the educational curriculum must be in step with the students developmental tasks. The organization of the information must address the immediate concerns of the learners. This is particularly true in organizational settings. Also, if there is a readiness to learn based on the developmental stages of the learners, it may be desirable to group the participants according to their needs, to facilitate a common direction within each group or class.

Finally, the adult is viewed as different from the child in their orientation towards learning. The adult brings a problem-centered approach to the learning situation, and seeks immediate solutions to existent problems. This contrasts with the younger students subject-centered, delayed application orientation. The implication for practice is that the educator of adults must build a flexible program of study around a problem solving orientation, rather than organizing a more structured subject-centered course. Advocates of andragogy endorse organizing classes (and entire sequences of courses), around problem areas, not subjects. This means that the instructor must

actively encourage, facilitate, generate, and listen to the problems, questions, and issues raised by the members of the class.

In sum, the assumptions made regarding the student lead to prescriptions for the successful practice of educating the adult learner. Figure II.1 provides a concise graphic comparison of the assumptions and designs of pedagogy and andragogy.

5. An Appraisal of Andragogy

It is difficult to understate the relevance and importance of a theory of adult learning to the field of training and development. If the basic progress which has been made by the proponents of andragogy can be refined, clarified and extended, to provide guidance in the application of the principles and methods, contingent upon the characteristics of the learner, then clearly the science of training individuals in the most effective manner will have made progress.

The discussion of andragogy provided here will address two related issues. The point will be developed that more attention should be given to the individual personality differences of the students, and how these individual differences relate to preferred learning styles. Secondly, the topic of the sample selection upon which the methods of andragogy have been derived will be discussed. Since the theory of andragogy was developed and refined primarily in voluntary adult educational situations, there arise serious questions as to the generalizability of the theory to situations in which the

Assumptions and Design Elements	Pedagogy	Andragogy
Self-concept	Dependency	Increasing self-directiveness
Experience	Of little worth	Learners are a rich resource of learning
Readiness	Biological development	Developmental tasks of social social pressure roles
Time perspective	Postponed application	Immediate application
Orientation to Learning	Subject centered	Problem centered
Climate	Authority -oriented formal, competitive	Mutual respect, collaborative, informal
Planning	By teacher	Mutual planning
Diagnosis of needs	By teacher	Mutual self-diagnosis
Objectives	Set by teacher negotiation	Mutual
Activities	Transmittal techniques	Experiential techniques
Evaluation	By teacher	Mutual re-diagnosis of needs

Figure II.1
A Comparison of Pedagogy and Andragogy
(adapted from Knowles, 1978, p.110)

individual does not have the choice of attending the educational program (such as in compulsory training and development programs, common in organizational settings). While reports of the successful application of the methods of andragogy in training situations have been reported (cf., Knowles, 1984), details are usually sketchy as to whether or not the training was compulsory.

Andragogy had been labelled "a theory of adult learning" (cf., Knowles, 1978). In the past, the critical factor in the andragogy-pedagogy controversy had been the chronological age of the learner. While distinctions based on the age of the student had been the prime method of categorization, it has been noted upon occasion that age may not be the sole determining variable which can account for differences in learning styles. Kuhlen (1962), for instance, noted that "...it is readily evident that age in and of itself is of little theoretical significance or practical importance in a naturalistic learning situation" (p. 3). Years before Lindemann (1926) had noted that there may be some benefit in applying the different types of instructional methods to selected individuals based on a match of the technique with the students predisposition for learning, regardless of the age of the student. McClusky (1964) warned against the overemphasis on chronological age in the determination of learning styles, and even Knowles (1980) retreated from his strict dichotomization according to age with the unelaborated admission that in some instances andragogical methods may be effective with children. In his 1984 book,

Knowles is much more explicit in stating that andragogy and pedagogy may be on a continuum, and that certain methods may be successful with certain individuals, regardless of their ages. Davenport and Davenport (1986) found that andragogical-pedagogical preferences were not related to age or educational background, and Merritt (1983) found that age was not a determining variable in establishing preferred learning styles. However still unanswered are the questions which ask when the different methods are best applied, where, with whom, and on what basis such decisions should be made.

Despite these occasional calls that the application of teaching methods be applied to individuals selectively, based on a match with their individual makeup, there still exists a lack of research or theory linking individual differences with preferred learning styles. In fact, attempts to link chronological age with learning styles still appear in the literature (cf., Merritt, 1983; Muzio and Ohashi, 1979; Morris, 1980). Though largely unsuccessful, these studies continued the misconception that age alone should account for differences in learning styles. It is possible that there will be a decrease in such attempts to link ages with learning styles, since Knowles (1984) and others have noted and published evidence that andragogy can be effective with all ages. Similarly, it is possible, thanks to the works of Noe (1986), that concurrent with the decreased emphasis on the role of chronological age, more attention will be put on the relationship of individual personality differences and learning styles.

Noe (1986) has directed attention to the importance of attending to trainees' attributes and attitudes, and determining how these individual characteristics may influence the effectiveness of training. He states that "...little attention has been devoted to studying why training programs are effective for some individuals and ineffective for others" (p.736). Noe proposed that attention be directed towards the combined effects of certain individual characteristics and situational factors on the motivation to learn. While the position which will be elaborated below is slightly different--that individual personality differences may account for differences in preferred learning styles--the perspective that more attention needs to be directed towards the individual characteristics of the trainee, if progress is to be made in making training programs more effective, is held in common.

A second illustration of the perspective that chronological age has been over-emphasized as the critical determinant of learning style is the profusion of attempts to make increased distinctions within adult learning theory. Added to andragogy and pedagogy were the labels "eldergogy" (Yeo, 1982), "geragogy" (Lebel, 1978), and "humanagogy" (Knudson,1979), each being an attempt to link suggested teaching methods with student ages. Labelled "gogymania" by Courtenay and Stevenson (1983), this stream of research demonstrated the acceptance of the belief that with increased age, and solely because of chronological age, individuals develop certain optimal ways of learning. The resultant conclusion from these assumptions would be that all members of the same age cohort should be

taught in the same manner. There exists a need to reconcile the prescriptions of these various perspectives, and ideally, to determine underlying themes and consistencies that will yield a more parsimonious, united theory of human learning styles. The ideas proposed below may provide such a vehicle for establishing a solitary theme and underlying continuities.

In sum, the first critical issue in andragogy is the role and importance of chronological age. In fairness to the proponents of andragogy, it is recognized that they have retreated from their former extreme position that chronological age alone will determine the optimal training style, and have since stated that the various training styles may be effective in different circumstances. However, despite the occasional references to the importance of individual differences in the determination of learning style, there have been few attempts to link measures of the individual differences of students, regardless of age, with optimal methods of instruction.

The second critical issue in andragogy involves the issue of sampling. Andragogy may not be so much a "theory of adult learning" (cf., Knowles, 1980), but rather a theory of learning for those persons who are apt to seek out and volunteer for learning situations. It is possible that individuals who volunteer for learning situations (e.g., attending continuing education programs at local colleges) are likely to exhibit preferences in their learning styles which correlate with the personality characteristics which brought them to the learning situation. These persons will desire learning situations which are

consistent with their individual makeup. To say that andragogy is a theory of learning for all adults, is to extend the theory to groups of persons who are not attracted to learning situations because they do not possess the individual difference makeup that would attract them to educational situations. The proscriptions and prescriptions of andragogy may not be accurate when dealing with groups of individuals who are not prone to volunteer for educational opportunities. This distinction is important since the basic tenants of andragogy have been generalized from adult education programs and broadly adopted and applied by various trainers in organizational settings (cf., Ingalls and Aceri, 1972), suggesting that the theory, developed primarily from a voluntary learner population, has been applied to individuals in compulsory learning situations. Again, the work of Noe (1986, 1987) is relevant. This second criticism, that the principles and prescriptions of andragogy have been derived from an unrepresentative sample, could, in Noe's terms indicate an attempt to generalize findings from a group of individuals characterized by a high motivation to learn to other individuals who may not be characterized as having a high motivation to learn.

The issue that needs to be addressed is whether there is a link between certain individual personality differences and learning styles, and whether it is safe to assume that individuals in compulsory training programs will have the same psychological profile, and thus the same learning style preferences, as those individuals who have sought out voluntary

educational programs. If the differences in preferred learning styles are dependent upon individual differences in the students, and these individual differences correlate with the individuals likelihood of seeking out and volunteering for educational programs, then it may be incorrect to assume that a theory of adult learning based on observations of voluntary adult learners could be broadly applied to all adults in learning situations. What needs clarification are the relationships between individual differences in the makeup of the adult learners, and those students preferred learning styles.

To summarize, the second critical point in this critique of andragogy concerns the practice of generalizing theory and methods generated from voluntary adult learners to situations in which the learners are compelled to attend. This issue, like the issue discussed first, refers to the importance of the individual personality differences of the learners involved, and how these individual differences should be considered before prescribing methods of training. However, before making explicit which individual differences will be hypothesized as being critical determinants of learning styles, and why, a brief discussion of the literature on lifelong development will be necessary to establish a basis for subsequent discussion of the hypotheses.

6. Adult Development

As previously stated, the pioneers of andragogy initially referred to the age of the student as the critical determinant of whether or not the methods of andragogy should be applied in

certain situations. In this section we turn to a discussion of why this generalization might have been made, and how the literature on adult development can be used as a starting point for a theoretical linkage of individual differences and learning styles. To adequately present a discussion of the variables that will be hypothesized as being among the critical determinants of learning styles, a brief review of the literature on adult development is necessary. As Rhodes (1983) pointed out that "...there is a need for the integration across academic disciplines. In particular, organizational psychologists researching age-related issues should be familiar with the gerontology and psychology of human development." (p. 357)

The position adopted here is that for adults, certain developmental changes will occur, and that these differences will occur at certain life stages. However, these maturational changes will not be perfectly determined by chronological age. Moreover, the argument will be presented that individuals preferred learning styles will be influenced by the maturational changes that they experience. Therefore, the psychology of human development, in conjunction with the measurement of certain individual differences, may shed light onto the issue of preferred learning styles.

Cross (1981) clarifies two different streams of study within the area of adult development. The first refers to phases of adult life cycles, while the second stream of research deals with developmental stages. Each will be discussed in an effort to discern important individual difference variables that may relate to preferred learning styles.

Adult Life Cycles

The work of Gould (1972), Levinson (1974), Sheehy (1976), Neugarten (1968), and Baltes and Shaie (1973) is representative of the first approach, the life cycle perspective. These researchers attempt to categorize and describe life phases by grouping together related characteristics of specific phases. Cross (1981) notes that in the great recent effort to identify age-linked phases that are common across the life cycle studies, a controversy has occurred "...not over the details of defining age boundaries or phasic descriptors but over the whole idea of using chronological age as a boundary" (p.171). This controversy, centered over the emphasis put upon chronological age, is similar to the point made earlier regarding the over-emphasis of the importance of chronological age in andragogy.

Thomas and Kuh (1982), provided a composite framework of early adult development (ages 22-40) by synthesizing the work of Gould (1978), Levinson, Darrow, Klein, Levinson, and McKee (1977), and Sheehy (1974), as shown in Figure II.2. While the figure lists life stages anchored by chronological ages, it also provides a listing of developmental tasks which are common in adult life, some of which are relevant to the topic of andragogy and adult education.

From Thomas and Kuh's (1982) syntheses, three general themes seem to emerge. The first is the adults increasing sense of self responsibility, or self reliance. This point was also clearly articulated by Knowles (1978), when, in contrasting the differing

Novice Adulthood (22-28)

1. Formation of life dreams, relationships with people supportive of the dream.
2. Pursuit of "the one right way to be", "shoulds" guide behavior.
3. Needs for intimacy, experimentation are primary, but create conflict.
4. Identification of personal and vocational choice.
5. Establishment of "home base".
6. Conflict between stability in vocation, significant other and exploration.

Rethinking Adulthood (29-32)

1. Rethinking of personal goals and commitments.
2. Re-examination of vocational choice.
3. Acceptance of similarities and differences between self and significant others, especially parents.
4. Reflection on past to lend direction on future endeavors and commitments.

Differentiated, Responsible Adulthood (33-40)

1. Acceptance of increased responsibility over one's lifestyle.
2. Desire for more authority in vocation.
3. Differentiation and integration of choices and commitments defined in preceding period.
4. Realization of some pertinent goals set as "Novice Adult".
5. Acknowledgement of, and satisfaction with a fuller range and depth of emotion.
6. Affirmation of role in society and workplace.
7. Continuing re-examination of decisions and commitments made in earlier period.

Figure II.2
Composite Developmental Framework, Years 22-40
(adapted from Thomas and Kuh, 1982, p.16.)

assumptions of andragogy and pedagogy he stated that as individuals mature their "self-concept moves from one of being a dependent personality toward being a self-directed human being." In varying degrees, the adult may develop an increasing sense of being responsible for, and to some extent, in control of the outcomes in his or her own environment.

The second theme clearly deals with achievement. "Dreams", "goals", "vocational choice", "vocational evaluation and exploration", "striving for success", and "desires of increased authority", all reflect a concern and desire for achievement. There seems to be agreement, at least among the authors included in these tables, that the adult is likely to pass through life periods in which there is a heightened concern for individual achievement.

The third theme is less clear than the first two. It concerns an evaluation of the self in time. This consists of an evaluation of the individuals achievements based on past events, current goals, and time left to accomplish remaining goals. This evaluation process, which also includes confronting one's own mortality, suggests a thoughtful evaluation of long-term goals and an awareness of the self as an instrument for achieving one's goals, will be further elaborated below.

Adult Developmental Stages

The second type of adult development research, more grounded in research and theory, deals with maturational

developmental stages. Research on stages of development, such as Erikson's (1960) psychosocial stages of development, Kohlberg's (1971) stages of moral development, Perry's (1970) cognitive development, and Loevinger's (1976) ego development represent this line of research.

Jane Loevingers work on ego development (1970, 1976) is of particular relevance to the topic of extending methods of instruction beyond applications based solely on chronological age to a more sophisticated application of instructional methods based on individual differences in development. It's here that themes (such as the third theme listed above) regarding the individuals sense of self and time can more adequately be addressed. Before addressing ego development, however, a brief discussion of self theory will be presented.

Loevingers work, grounded in self theory, provides a vehicle in which Salancek and Pfeffer's (1977) call for more phenomenological approaches to organizational research can be realized. Snyder and Williams (1982) point out that self theory "is based on the premise that human beings have a fundamental need to maintain or enhance the phenomenal self" (p. 257). In their review of self-theory and application of self theory to work motivation, Snyder and Williams (1982) point out the popularity of references to "the self" in organizational research. "Self-perception" (Bem, 1972; Heider, 1958; Staw, 1976), "self-efficacy" (Bandura, 1979), Super's self in career development, "self-consistency" (Korman, 1970) , self actualization (Maslow, 1954), all refer explicitly to the self, while need theories, equity theory, attribution theory, expectancy theory,

and goal setting theory can all be interpreted from the perspective of self theory.

The growth of the self is the process that Diggory (1962) is describing in the following : "...the individual comes to regard himself as the instrument, sine qua non, for achieving his goals" (p.60). Loevinger, working within the parameters of self theory, proposes that individuals develop their core personality in an ordered sequence from simple to increasingly complex capacities. Ego development, more encompassing than moral development or cognitive development, refers to the use of the ego as "the central frame of reference through which people view themselves and their relations with others" (Cross, 1981, p.176). Loevinger (1979) says "Ego development, as we shall use the term, encompasses the complexity of moral judgement, the nature of interpersonal relations, and the framework within which one perceives oneself and others as people" (p.3). The individual may, though will not necessarily, develop from simple, stereotypical thinking, to an awareness of multiple possibilities and opportunities, and elaborated, conceptually complex thinking. The individual may develop from impulsive, exploitive behavior to an awareness of the implications of behavior and an awareness of the causation of events. Figure II.3 shows the stages of ego development. Critical to this line of thinking is the view that not all individuals, simply by virtue of increased age, will progress from the simplistic, impulsive style to the rich integrated style.

FIGURE II.3.
Loevinger's Stages of Ego Development

Ego Level	Impulse Control/ Character Development	Interpersonal Style	Conscious Preoccupation	Cognitive Style
I. Impulsive	Does not recognize rules Sees action as bad only if punished Impulsive Afraid of retaliation	Dependent and exploitive dependence unconscious Treats people as sources of supply	Sex and aggression Bodily functions	Thinks in dichotomous way Has simple, global ideas Conceptually confused Thinks concretely Egocentric
II. Self-protective	Recognizes rules but obeys for immediate advantage Has expedient morality: action is bad if person caught Blames others, does not see self as responsible	Manipulative and exploitive Wary and distrusting of others' intentions Opportunistic Zero sum: I win, you lose Shameless; shows little remorse	Self-Protection Gaining control and advantage, dominating Getting the better of others, deceiving them Fear of being dominated controlled or deceived by others	As above
III. Conformist	Partially internalizes rules obeys without question Feels shame for consequences Concerned with "shoulds" Morally condemns others' views Denies sexual and aggressive feelings	Wants to belong to group, to gain social acceptance Feels mutual trust within in-group, prejudice against out-group Has pleasing social personality: superficial niceness, helpfulness	Appearances Social acceptance and adjustment to norms Status symbols, material possessions, reputation and prestige	Thinks stereotypically Uses cliches Sees in terms of superlatives Has sentimental mentality Has little introspection: references to inner feelings are banal and stereotyped

(Continued on next page)

FIGURE II.3. (Continued)

Ego Level	Impulse Control/ Character Development	Interpersonal Style	Conscious Preoccupation	Cognitive Style
IV. Conscientious	Standards self-evaluated: morality internalized Self-critical, tendency to be hypercritical Feels guilt for consequences	Has sense of responsibility, obligation Has mutual, intensive relationships Concerned with communication, expression of differentiated feelings	Achievement of long-term goals as measured by inner standards Attaining ideals Motivation, reasons for behavior Self: feelings, traits	Conceptually complex Has sense of consequences, priorities Aware of contingencies, perceives alternatives Sees self in context of community, society
V. Autonomous	Add: [a]Behavior an expression of moral principle Tolerates multiplicity of viewpoints Concerned with conflicting duties, roles, principles	Add: [a]Wants autonomy in relations Sees relations as involving inevitable mutual interdependence Tolerates others' solutions of conflict Respects others' autonomy Open	Individuality and self-fulfillment Conflicting inner needs	Has greater conceptual complexity Tolerates ambiguity Has capacity to see paradox, contradictions Has broad scope of thought (time frame,social context) Perceives human interdependence
VI. Integrated	Add: [a]Reconciles inner conflicts and conflicting external demands Renounces the unattainable Concerned with justice Spontaneous, creative	Add: [a]Cherishes individuality	Add: [a]Integrated sense of unique identity "Precious life's work" as inevitable simultaneous expression of self, principle, and one's humanity	Add: [a]Has sense of self as part of flow of human condition

[a] "Add" means add to the description applying to the previous level. (Source: Adapted from J. Loevinger, Ego Development, p.110)

At the lower levels of ego development, an image emerges of an individual who would seem unlikely to participate in educational opportunities; at higher levels, the image is one of participators, of people who'd prefer the methods of andragogy. The lower levels suggest impulsive individuals who feel controlled by the situation in which they find themselves, whereas the upper levels characterize individuals who appear more autonomous, feel in control of their life situation, and have goals and aspirations.

Kolb (1981) contends that increased ego development represents increased adaptive flexibility and self-directedness. On his Learning Style Inventory, to be addressed below, such characteristics describe an "accommodative" learning orientation. One characteristic of this level of functioning is "proactive adaptation", of the sort endorsed earlier in this discussion by Toffler (1976). So the works of Kolb (1981), Loevinger (1976), Toffler (1976), and Knowles (1979) seem to reach a common point. Knowles (1979) descriptions of the adult learner profiles Loevingers (1976) higher ego development individuals. The educational preferences of these individuals, as described to Knowles (1979), matches Kolb's description of the active learning style. This learning orientation is characterized by the pre-adaptive learning that Toffler (1976) suggests as necessary for the future survival of the individual. Such a planful, forward thinking individual would be characterized by Loevinger (1976) as displaying a moderately high level of ego development. All

this seems to indicate that there is some degree of consistency, or convergence, across the respective domains and paradigms.

The purpose of this brief exposure to self theory was to present the view that individuals may differ in their levels of ego development. The parallels between Loevinger's (1976) stage theory and two other important individual difference variables that are relevant to andragogy can now be made explicit. From the research on adult development, it became apparent that references were made to the concepts of the locus of control and level of achievement motivation of the maturing individuals. Similarly, it appears that individuals low on Loevingers (1976) scale are likely to display an external locus of control and a low achievement orientation. As one progresses up the scale, in addition to the other changes proposed to be occurring in the individual, the individual is likely to display a more internal locus of control and display a higher need for achievement. These individual difference variables, need for achievement, locus of control, and ego development, provide the foundation for the proposed differences between persons who are likely to seek and volunteer for educational programs and those who don't. It is also proposed that these individual differences may provide insights into the reasons as to who might benefit from andragogical methods, and why.

In light of the themes discussed above, it is suggested that adult individuals vary in the degree to which they possess an achievement orientation, the degree to which they believe they have control over the occurances and outcomes in their immediate environment, and the perceptions that they have

regarding "the self", their view of "the self" as a tool for achieving their desired goals, and the nature of their interpersonal relations with others. It is proposed that these individual differences will distinguish between persons who are apt to volunteer for educational programs and those persons who do not actively seek to learn. It seems unlikely that an individual would seek a learning situation if that person had a low desire to achieve, possessed the belief that he or she had little or no control over the rewards in the environment (whether immediate or delayed), and had a high degree of impulsiveness influencing their behaviors (i.e, a low level of ego development). On the other hand, the persons who desire to achieve, who feel that they have some control over the outcomes in their environments, and who possess a planfulness and awareness of the implications of their own behavior, seem more likely to seek personal development through training or education.

According to Carlson (1979), "Malcolm Knowles could, and probably would, argue that it is the degree of self-directedness or autonomy, experience, readiness to learn, present-centeredness, problem-centeredness, and maturity which distinguishes adulthood from childhood and which therefore influences the process of andragogy and pedagogy." (p. 54) This description, when put into the nomenclature of this study, might be characterizing individuals with an internal locus of control, high ego development, and a high need to achieve. Carlson's (1979) list of characteristics, however, does not necessarily

characterize all adults, nor does it clarify the inadequately conceptualized theoretical link between the individual characteristics and preferred learning styles.

In sum, individuals' learning styles may be greatly influenced by their levels of achievement motivation, their orientation as regards to locus of control, and their levels of ego development. This provides a plausible explanation as to why the methods of andragogy will appeal to the standard adult learner volunteer, since persons so characterized would likely prefer higher levels of autonomy, greater input into the learning process, and an emphasis on practical application. Conversely, certain personality characteristics may predispose an individual towards benefitting more from, and having a more positive reactions to , the more pedagogical methods. These possibilities are elaborated below, as the individual differences conceptualization proposed here is operationalized.

7. Hypothesis One

Hypothesis 1 concerns the expected relationship between particular individual personality differences and learning styles. The point had been made that volunteers for adult education may exhibit higher achievement drives, have higher levels of ego development, and may be more likely to entertain the belief that they are in control of some of the events in their lives and immediate environment. From this group the methods and principles of andragogy had been developed.

For the purposes of assessing the relationship between individual personality differences and learning styles, the following measures are proposed to assess individual differences: (1) The Achievement scales from the California Psychological Inventory (CPI), (Gough, 1957), (2) Rotter's (1966) Locus of Control Scale, and (3) Loevinger's (1976) Measure of Ego Development.

The CPI is preferable to other measures of achievement because it has independent Achievement-Independence and Achievement-Conformance scales, which indicate not only achievement levels, but also differentiates among different types of achievement. The importance of differentiating among different types of achievement will be further elaborated in the discussion and hypotheses below. Rotter's (1966) Locus of Control Scale is a 23 item measure which locates an individual at a point on a hypothetical continuum, between the polar extremes of internal locus of control and external locus of control. Loevinger's (1976) Measure of Ego Development is a sentence completion test which indicates the individual's level of ego development. Trained raters are required to score this 36 item test.

Kolb's (1981) Learning Style Inventory, which assesses an individuals orientations toward learning, will be used as the measure of preferred learning style. Many inventories are available which assess constructs related to individual learning preferences. For instance, the Learning Style Inventory created by Dunn, Dunn, and Price (1987) assesses individual preferences regarding the immediate learning environment (sound, heat,

light, design), emotionality (motivation, persistence, and structure), sociological needs (self-oriented, adult oriented, peer oriented), and physical needs (such as perceptual preferences and time of day). Canfield's (1980) Learning Style Inventory addresses individual's learning preferences for four conditions of learning (affiliation, structure, achievement, and eminence). The Inventory of Learning Processes (Schmeck Ribich and Ramanaiah, 1977) is a self-report inventory, which results in scores on the four scales of Synthesis-Analysis, Elaborative Processing, Fact Retention, and Study Methods.

Due primarily to the conceptual fit of the measure with the work of Loevinger (1976) and Knowles (1980, 1984) Kolb's Learning Style Inventory was selected as the measure to be used in the research. Kolb (1981) describes his measure in this way:

> The LSI measures a persons relative emphasis on each of the four modes of the learning process- concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE)- plus two combination scores that indicate the extent to which the person emphasizes abstractness over concreteness (AC-CE) and the extent that the person emphasizes action over reflection (AE-RO) (p.68, 1981).

The CE persons becomes actively involved in new experiences. The RO orientation involves thinking and reflecting upon experiences from a variety of perspectives. The AC orientation focuses on using logic, ideas, theory building, and conceptualizations. AE involves the use and testing of existing theories to solve problems. These two dimensions, juxtaposed, create a 2 X 2 typology with individuals being categorized in one

of four quadrants. The labels "convergence", "assimilation", "divergence", and "accommodation" apply to the respective quadrants, as shown in Figure II.4

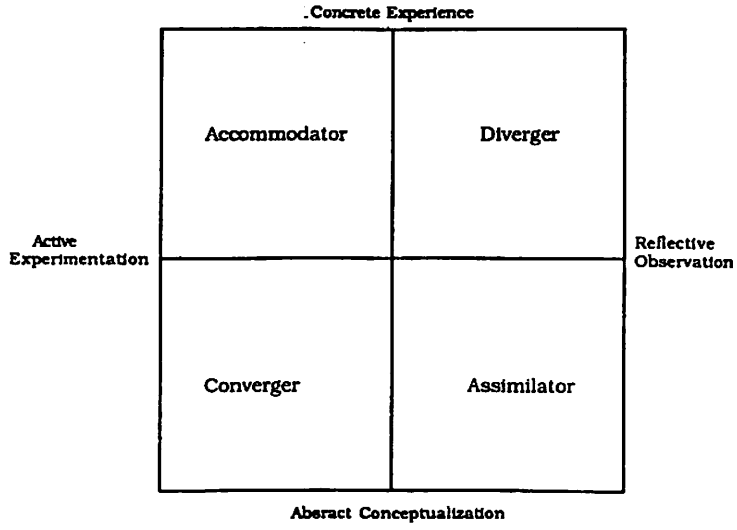


Figure II.4
Kolb's Learning Styles

Among the individual differences measures, it is predicted that achievement-conformance will have a zero or negative correlation with all the other measures. It is also predicted that there will be low positive correlations among achievement-independence, ego development, and internal locus of control.

The score predicted to be of particular importance in this study, as generated by Kolb's (1981) LSI, is the AE-RO dimension. This score assesses the degree to which the individual emphasizes Active Experimentation over Reflective Observation, or vice versa. By using the norms generated from previous administrations of the LSI, it has been found that when the AE score exceeds the RO score by 6 points or more,

individuals are characterized as being more active than reflective in their learning orientation. Using this convention, the relationships listed below will be assessed.

1. Individuals who score as "active learners" as measured by Kolb's (1981) LSI (i.e, their AE score exceeds their RO score by at least 6 points) will have:

   a. a lower mean Locus of Control score (i.e., will show a more internal locus of control) in comparison to the mean Locus of Control score for individuals who score as "reflective learners".
   b. a higher mean Achievement-Independence score in comparison to the mean Achievement-Independence score for individuals who score as "reflective learners".
   c. a lower mean Achievement-Conformance score in comparison to the mean Achievement-Conformance score for individuals who score as "reflective learners".
   d. a higher mean score on the Ego Development measure in comparison to the mean Ego Development score for for individuals who score as "reflective learners".

Each of the parts of this hypothesis can be assessed by conducting an analysis of variance, with scores for Locus of Control, Achievement-Conformance, Achievement-Independence, and Ego Development as the respective dependent variables.

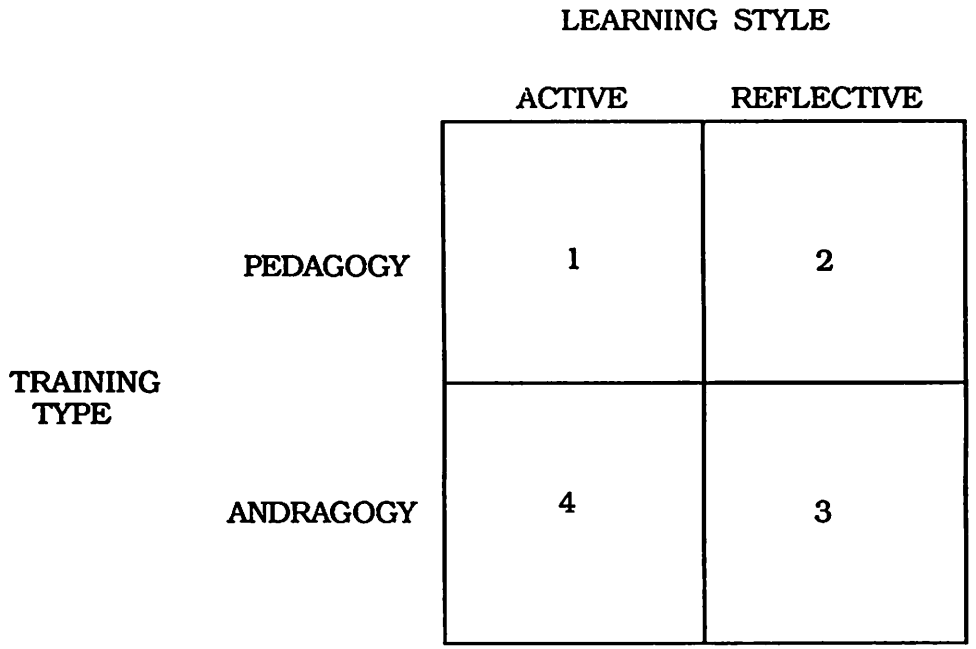
8. Hypotheses Two Through Five

Hypotheses 2 through 5 concern the expected relationship between learning styles and outcome measures after the

participants have been exposed to one of two approaches to training.

Preferred learning styles, as indicated by Kolb's LSI, will be related with measures of satisfaction, self-reported learning, and an objective measure of learning, after exposure to one of two styles of training sessions. Hypotheses 2 through 5 can be assessed by conducting Analyses of Variance, using the satisfaction, self-reported learning, and an objective measure of learning scores as the dependent variables.

It is hypothesized that the three dependent variables will be higher in "congruent" training situations than in "incongruent" training situations. Congruent training situations are those in which participants learning styles match the training type to which they are exposed, and incongruent training situations are those in which participants learning styles do not match the training type to which they are exposed. Andragogical training for active learners and pedagogical training for reflective learners are specified here as congruent training situations, while pedagogical training for active learners, and andragogical training for reflective learners are specified as incongruent training situations. Quadrant 2 and quadrant 4 of Figure II.5 represent the congruent training situations, while quadrant 1 and quadrant 3 represent the incongruent training situations. It is hypothesized that the congruent training situations will result in more learning, higher self-reported learning scores, and higher satisfaction scores than the incongruent training situations. The following specific relationships are hypothesized, and are illustrated in Figure II.5.



HYPOTHESES 2a, 2b, 2c: 4>1
HYPOTHESES 3a, 3b, 3c: 4>3
HYPOTHESES 4a, 4b, 4c: 2>3
HYPOTHESES 5a, 5b, 5c: 2>1

Figure II.5
Hypotheses 2 through 5

2a. Individuals with active learning styles will demonstrate more learning (i.e., higher average Objective Learning .scores) in the andragogy sessions than will individuals with the active learning style who are exposed to the pedagogy condition.

2b. Individuals with active learning styles will report more learning (i.e., higher average Self-Reported Learning scores) in the andragogy sessions than will individuals with the active learning style who are exposed to the pedagogy condition.

2c. Individuals with active learning styles will report more positive reactions (higher average Satisfaction scores) to the andragogy sessions than will individuals with the active learning style who are exposed to the pedagogy condition.

3a. Individuals with active learning styles will demonstrate more learning (i.e., higher average Objective Learning score) in the andragogy sessions than will individuals with the reflective learning style who are exposed to the andragogy condition.

3b. Individuals with active learning styles will report more learning (i.e., higher average Self-Reported Learning scores) in the andragogy sessions than will individuals with the reflective learning style who are exposed to the andragogy condition.

3c. Individuals with active learning styles will report more positive reactions (higher average Satisfaction scores) to the andragogy sessions than will individuals with the reflective learning style who are exposed to the andragogy condition.

4a. Individuals with reflective learning styles will demonstrate more learning (i.e, higher average Objective Learning scores) in the pedagogy sessions than will individuals

with the reflective learning styles who are exposed to the andragogy condition.

4b. Individuals with reflective learning styles will report more learning (i.e., higher average Self-Reported Learning scores) in the pedagogy sessions than will individuals with the reflective learning styles who are exposed to the andragogy condition.

4c. Individuals with reflective learning styles will report more positive reactions (higher average Satisfaction scores) to the pedagogy sessions than will individuals with the reflective learning styles who are exposed to the andragogy condition.

5a. Individuals with reflective learning styles will demonstrate more learning (i.e, higher average Objective Learning scores) in the pedagogy sessions than will individuals with the active learning styles who are exposed to the pedagogy condition.

5b. Individuals with reflective learning styles will report more learning (i.e., higher average Self-Reported Learning scores) in the pedagogy sessions than will individuals with the active learning styles who are exposed to the pedagogy condition.

5c. Individuals with reflective learning styles will report more positive reactions (higher average Satisfaction scores) to the pedagogy sessions than will individuals with the active learning styles who are exposed to the pedagogy condition.

CHAPTER III

METHODOLOGY

1. Sample

The participants in this study were supervisors at a large federally operated utility company with plants and properties in 6 Southeastern states. The study was incorporated into a four day training program which all supervisors were required to attend. Participants in this study attended one of the seven consecutive sessions which were offered from January 5, 1988 to March 11, 1988. A power analysis indicated that a sample of 200 subjects was needed to achieve power greater than .80 for all the hypotheses in the study (Cohen, 1977).

Two groups of subjects were used, one group of 24 supervisors was used for the pilot study of the measure of objective learning and the Learning Syle Inventory. The second group was the sample of 213 supervisors used to assess the hypotheses of the research project. Tables III.1 and III.2 show the demographic information about the group of 24 supervisors used in the pilot study, and the group of 213 supervisors used to assess the hypotheses of the research, respectively. Age, in accordance with the wishes of the management group of the agency at which the research was conducted, was collected in

Table III.1
Demographic Information on Sample Used in the Pilot Study.

Gender	N	Percent	Age	N	Percent	Highest level of Education	N	Percent
Male	20	74	under 20	0	0	High School	6	22
Female	7	26	21-25	1	3.7	College	16	59
			26-30	5	18.6	Masters	5	19
			31-35	9	33	Ph. D.	0	0
			36-40	6	22.2			
			41-45	4	14.8			
			46-50	2	7.4			
			over 51	0	0			

Table III.2
Demographic Information on Sample Used in the Research.

Gender	N	Percent	Age	N	Percent	Highest level of Education	N	Percent
Male	171	82.2	under 20	1	0.5	High School	66	31.7
Female	37	17.8	21-25	7	3.7	College	101	48.6
			26-30	17	8.2	Masters	32	15.4
			31-35	51	24.5	Ph. D.	9	4.3
			36-40	48	23.1			
			41-45	32	15.4			
			46-50	19	9.1			
			51-55	23	11.1			
			56-60	9	4.3			
			61-65	1	0.5			
			over 65	0	0.0			
			no data	7	3.3			

age groupings. Participants checked the box noted whether they were between 20-25 years of age, 26-30 years of age, and so on.

2. Measures

The measures used in this study were the Achievement-Conformance and Achievement-Independence Scales of The California Psychological Inventory (Gough, 1957), The Learning Style Inventory (Kolb, 1985), Rotters' Locus of Control Scale, (Rotter, 1966), Loevinger's Measure of Ego Development for Males and Loevinger's Measure of Ego Development for Females, (Loevinger, 1976), The Participant Survey Form, and The Measure of Objective Learning. All of the measures used in this study appear in Appendix A.

Achievement-Conformance and Achievement-Independence are two of 18 personality dimensions measured by The California Psychological Inventory (Gough, 1957). The CPI is a non-pathological psychological assessment instrument which consists of 480 statements. The test-taker responds to each item as being either true or false. The Achievement-Conformance and Achievement-Independence scales consist of 38 and 32 questions respectively. Sample questions from this scale appear in Figure III.1.

The Learning Style Inventory (Kolb, 1985) is based on Kolb's (1985) model of experiential learning. It assesses the

I have a strong desire to be a success in the world.	True	False
I was a slow learner in school.	True	False
I often lose my temper	True	False
I like poetry.	True	False

Figure III.1
Sample Questions from the
California Psychological Inventory
(from Gough, 1957.)

extent to which an individual demonstrates a preference for a particular learning style. Twelve sentence stems are presented along with four choices for completing the sentence. The test taker is asked to rank order the endings for each sentence according to how well they describe how that individual would go about learning something. The item choices which are to be rank ordered, are in columns, which are then summed to get the individuals' scores for Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation. Sample items from The LSI appear in Figure III.2.

The Locus of Control Scale (Rotter, 1966) is a 23-item test which measures the extent to which individuals perceive that outcomes in their environment are caused by their own inititative and behaviors. The Locus of Control Scale consists of

I learn by	__feeling	__watching	__thinking	__doing
When I learn	__I get involved	__I like to observe	__I evaluate things	__I like to be active

Figure III.2
Sample Questions from
The Learning Style Inventory
(from Kolb, 1985).

23 pairs of sentences, and the individual is asked to report which of each sentence pair he or she agrees with the most. The choices indicating an external locus of control are tallied, and high scores on this scale indicate an external locus of control, and low scores indicate an internal locus of control. Sample items from this scale appear in Figure III.3.

The Measure of Ego Development (Loevinger, 1976) is a 36-item sentence completion test which requires scoring by experienced raters. Each item is scored individually, then a total protocol rating (TPR) is derived based on the ratings of the individual items. Each item consists of an open-ended unfinished sentence stem which the respondent completes in writing. Higher scores on this measure reflect higher levels of ego development. Sample questions from The Measure of Ego Development appear in Figure III.4

1a. Many of the unhappy things in people's lives are partly due to bad luck.
1b. People's misfortunes result from the mistakes they make.

2a. One of the major reasons we have wars is because people don't take enough interest in politics.
2b. There will always be wars, no matter how hard people try to prevent them.

Figure III.3
Sample questions from
The Locus of Control Scale
(Rotter, 1966).

The satisfaction and self-reported learning variables were derived from the Participant Survey Form. Items 1-12 were summed to form the satisfaction scale, and items 13-18 were summed to form the self-reported learning variable. Higher scores reflect higher levels of the measured attribute. The Participant Survey Form is presented in Appendix A.

The Measure of Objective Learning was created for the purposes of this study. Test questions, which were submitted by the members of the training and development department, were combined into a 27-item test of objective learning. This 27-item test was then pilot tested to assess its pychometric characteristics, and resulted in the 15-item measured used in the research. The 15-item measure, consisting of 7 multiple

1. Raising a family

2. Women are lucky because

3. If my mother

4. When they avoided me

Figure III.4
Sample Sentence Stems from
The Measure of Ego Development
(Loevinger, 1976)

choice questions and 8 true-false questions, is presented in Appendix A.

The measures which were assessed in the pilot were the Learning Style Inventory and The Measure of Objective Learning.

3. Pilot Test

The pilot test had two primary objectives. The first was to assess the psychometric properties of the The Measure of Objective Learning and use that information to improve the measure for use in the research. The second objective of the pilot study was to assess the psychometric characteristics of the LSI. Only these measures were pilot tested due to organizational

constraints and the fact that the other measures used in this research had been extensively used and validated.

The questions for the Objective Learning (OL) measure were, by the request of the organization, submitted by the trainers who would be conducting the andragogy and pedagogy sessions. The original version of the OL form that was pilot tested had 27 questions. The psychometric characteristics of the Objective Learning form which was pilot tested appear in Table III.3.

Table III.3
Descriptive Statistics and Coefficient Alpha
Reliability Estimates for the Measures in the Pilot Study

Variable(items)	N	Central Tendency[a]	SD	Actual Range[b]	alpha
LSI					
CE(12)	26	23.73	8.02	13-47	.88
RO(12)	26	29.59	7.15	20-46	.84
AC(12)	26	33.92	7.92	20-46	.87
AE(12)	26	32.81	7.06	14-47	.83
Obj. Learning I(27)	24	23.12	1.75[c]	19-26	.18[c]
Obj. Learning II(15)	24	11.91	1.88[d]	7-15	.48[d]

a. Central Tendency for LSI represents mean of column totals.
b. Reported ranges for LSI are the sums of the forced choice scores for the items comprising the variable.
c. Calculated on 15 items since 12 items had zero variance.
d. Calculated on 12 items since 3 items had zero variance.

The 27 questions in the pilot test were assessed based on the system of item analysis discussed in Anastasi (p. 204, 1982). In this process, the first step is to score all the tests. The test scores are then divided into 3 groups, on the basis of total number of items correct. The upper third consists of the highest scoring group, the lowest scores were put into the bottom third, and the rest of the scores were placed in the middle third. Next, with each individuals score grouped in the appropriate third, each response to each item is tallied. A measure of item difficulty is derived by simply adding the total number of correct responses for the item, across the 3 groups. If the total number of correct responses was high, then the item was considered to be a relatively easy item. The next step is to calculate a percentage, based on the number of each group that had the correct response to that particular item. An items' discriminabilty index is then derived by subtracting the percentage of the lower group that got the item correct from the percentage of the upper group that got the item correct. A positive number indicates that a larger percentage of the higher scoring group got the item correct, a negative number indicates that a larger proportion of the lower scoring group got the item correct.

Using these method, the 27 item pilot test was reduced to a 15 item measure of Objective Learning. Questions were selected

primarily on the basis of their ability to discriminate between lower and higher performers. Nine items which every participant completing the pilot Objective Learning (I) test got correct were dropped from the final Objective Learning (II) measure, since the items had no variance, and therefore had a discrimination index of zero. Also dropped were items with a negative discrimination index (i.e., ones in which a larger percentage of the lower scoring group got the item correct than did the high scoring group). The psychometric statistics on the 15 items selected for the final version of the Objective Learning (II) measure also appear in Table III.3.

A psychometric analysis of the LSI was also conducted. The results of this assessment appear in Table III.3. When these results are compared with the data in Table III.4, it can be seen that the column means, standard deviations, and Cronbach alpha's from the pilot test of the LSI are very similar to those reported in the technical specifications for the LSI (Kolb, 1985). Also, the intercorrelations among the raw scale scores of both the LSI pilot and the LSI technical specifications, were very similar, and both follow the predictions of the experiential learning theory (i.e., the strongest negative relationships between AC and CE, and AE and RO, and no relation between AC-CE and AE-RO.

Variable	N	Mean	S.D.	Alpha
CE	268	26.00	6.8	.82
RO	268	29.94	6.5	.73
AC	268	30.28	6.7	.83
AE	268	35.37	6.9	.78

Figure III.4
Technical Specifications of the LSI
(from Kolb, 1985).

4. Procedure

The study was conducted at a large federally operated utility company with plants and properties in 6 Southeastern states. The study was incorporated into the "Orientation to Supervision" program, an ongoing training program which the organization required all its' supervisors to attend. Seven consecutive OTS sessions of the program were selected for this research over a period from January 5, 1988 to March 11, 1988.

The extensive 4-day training program consisted of several topics. One of these topics, "Selecting the Right Person for the Job", was chosen as the module to be covered using both adragogical and pedagogical methods. The content presented on

the topic was not altered, and the information communicated in both the pedagogical and andragogical sessions was held constant. Only the methods by which the infomation was communicated was varied.

Seven trainers were used in conducting this study. Each trainer was briefed on the project, familiarized with andragogical and pedagogical methods of instruction in a series of three meetings, and received a "train the trainer" packet. The "train the trainer" packet provided the trainers conducting the Andragogy/Pedagogy study with the theoretical background of the research, a thorough documentation of the process and logistics of the study, and also established a high degree of familiarity with the measures and methods to be used. Of the seven trainers, 4 used pedagogical methods, and 3 used andragogical methods. A pair of trainers conducted each OTS session, one covered the Selection material using pedagogical methods, and the other covered the same material using andragogical methods. The rest of the OTS workshop was the same for all workshop participants.

"Selecting the Right Person for the Job" was covered on the fourth day of the workshop, from 8:15 a.m. to 10:15 a.m. However, before that time, several research-relevant events occured. Previous to the workshop, a memorandum was sent to OTS participants welcoming them to the workshop and explaining that there would be research related to training

conducted during their OTS session. OTS participants were ordinarily sent a memorandum prior to attending the program, the only change was the additional paragraph explaining the existance of an ongoing research project. This memo addressed the objectives in very broad terms, and also explained the importance of each participants' role in the research.

On the first morning of the workshop, introductory statements regarding the research were made. The introductory statements regarding the research were brief, and were inserted between the "Housekeeping" remarks, and the "Why you are here" sections of the usual OTS introduction. The following statement was read to the OTS participants:

> It was mentioned in the memo that you received that TVA is conducting research assessing whether certain individual differences influence the effectiveness of training. As part of that research, selected sessions during this workshop will be tape recorded to insure that the presentations are in line with the requirements of the research. Also, throughout this Orientation to Supervision you'll be asked to fill out certain measures that will help us in establishing the most beneficial programs possible at TVA. We'll give you participant numbers to link the various forms that you'll fill out to each other, but your reponses on these measures will be totally anonymous, and in no way will reflect upon you as an individual. For that reason we ask that you completely fill out each form as candidly as possible. For our purposes, it's important that we get as much data as we can. We know that we'll be asking you to fill out a lot of forms and measures, but

please bear with us. The fact that we're trying to make TVA's training programs as effective as they can possibly be means that it will require a lot of effort, both on your part and on ours, and we want you to know that we appreciate your cooperation in this project. For those of you who're interested, further information about the nature of the research can be provided at the end of the project. We, as trainers do not necessarily know, and for the sake of the research, could not tell you what each of the measures are assessing. At the end of this workshop we'll give you the name of the person that you can contact to get more information about the nature of the research and the mesures used. Again, since the purpose is to gain information that will help us to make TVA's training programs as effective as possible, we thank you for your participation.

The participant numbers were distributed after the introductory talk. The participant numbers were used as a means of tracking the data, in place of using participant names. The numbers were written on small cards which also had the name and address of the person that interested individuals could contact if they wanted more information about the research. It was emphasized to the participants that the numbers could not be traced to individuals, and that the trainer had no record of who was receiving particular numbers. This was done to make explicit the fact that their responses would remain completely anonymous. It also meant that their care in storing and remembering the numbers was very important. All participant numbers consisted of three digits. The first number designated

the workshop that the individual was attending, while the second and third numbers designated the individual. The workshops had the following prefix numbers: January 5-8, #1--; January 12-15, #2--; January 19-22, #3--; January 26-29, #4--; February 9-12, #5--; February 23-26, #6--; March 8-11, #7--.

To assign numbers to the participants, the trainers simply distributed the stack of cards. Trainers were given these prepared cards, with the numbers already on them, prior to each workshop. In the event that a participant lost his/her number- the trainer assigned the number of the workshop followed by "99". If another person lost their number, the trainer assigned the number "_98", and so on, in descending order.

After the introductory comments, and the assignment of participant numbers, the usual schedule for the first day of OTS was followed. At the end of the first day, the trainers distributed, administered, and collected the Locus of Control Scale and the Learning Style Inventory. Participants were reminded to put their participant numbers on the forms, since measures without numbers could not be linked with one another, and were therefore of limited use.

Each of the tests and measures which were used in the project were put in packs of 50 into large, clearly marked envelopes. The name of the test, its abbreviation, and the day and time at which it is to be distributed were written on the label of the envelope. The six tests and measures used during

each OTS workshop were stored together at each training location (i.e., at the Brookvale Building in Knoxville, and The Chestnut Street Towers in Chattanooga).

The normal agenda was followed during the second day of the Orientation to Supervision. At the end of day two, the trainers distributed the questions from the California Psychological Inventory. Trainers were instructed to refrain from referring to the measure as a measure of achievement, since doing so might cause some type of attempts to appear more or less achievement oriented. This instrument was distributed at 4:15, completed, and returned immediately to the trainers. The trainees were reminded to put their participant numbers on the form.

The normal OTS schedule was followed for day three. At the end of day three, the trainers distributed the Ego Development Scale, read the directions at the top of the first page, asked participants to put their participant numbers on the forms, and allowed time for the completion of the test. The time period from 3:45 p.m. to 4:30 p.m. on day three had been set aside for the completion of the Measure of Ego Development.

Trainers were reminded that it was of utmost importance that different forms be given to males and females, since the sentence stems differ for each gender. The Ego Development test forms for females had the letter "F" in the upper right hand corner of the cover page. Similiarly, the test forms for males had the letter "M", in the upper right hand corner of the cover page.

In the morning of day four, the larger group was divided into two smaller groups for the andragogical and pedagogical training sessions. The group were divided so that there were approximately equal numbers of participants in each group. The trainers divided the participants into groups by having them count off, and then had all the even numbers and odd numbers accompany a particular trainer into the separate training rooms. One group went with the trainer who was to use andragogical training methods, and one group went with the trainer who was going to use the pedagogical approach to training.

Once in the separate rooms to cover the topic, a general introductory statement was made. For the andragogy group the trainer said:

> We're going to now turn to covering the topic of selecting the right person for the job. As adults we've all had a lot of job-related experiences, and quite a bit of TVA experience, too. Since thats the case, we've probably also all had a lot of experience in one way or another with the topic of selection. Given the nature of this material, and the fact that we do have a lot of experience with the topic, it's usually best to cover it in a more open, participative, discussion-type format. Also, you probably have an idea of what you know already about the topic, and therefore have an idea of what additional information you personally need to know. So rather than having me stand up here and lecture about a lot a facts and details, I'll instead serve as a guide in the process as we discuss many of the important points relevant to the topic of "Selecting the right person for the job.

For the Pedagogy group, the trainer said:

> We're going to now turn to covering the topic of "Selecting the right person for the job". The material is very factual in nature, and there a fixed body of information that we need to cover. It's probably safe to assume that most of you have had a limited amount of experience with *all* the facets of selecting individuals for positions here at TVA, so we'll try to cover all the information that you need to know. It's usually best cover this material with a information delivery, or a standard lecture format. If during my talk on selecting the right person for the job you have a question, you may certainly ask it, but since we have a considerable amount of information to cover, I ask that you keep such questions to a minimum.

Trainers were encouraged to try and keep the amount of time spent in the sessions approximately the same. It was emphasized that the content covered in the two sessions should be identical. Since it was possible that the pedagogy group was likely to finish covering the material first, trainers were instructed to consider some "backup" plans to use the time. Options included pointing out and explaining the use of the resource table, or providing a short discussion and review of the sections in the handbook which were not covered in the OTS training. It was preferable that this time not be considered "break time".

As a manipulation check, the "selection" sessions were audio taped to assess the percent of "oneway communication"

(i.e., the amount of lecture time) that was taking place. The audio taping also allowed for a rough count of the number of discussion comments offered by participants during the training session. Before beginning of the "Selection" session, trainers reminded the participants that certain training sessions were taped for research purposes, and that this is one of those times. One other module during the OTS training, previous to the "Selection" topic was also taped, so as not to sensitize the participants to the only taped session. At the beginning of each taped session, trainers simply switched on the tape recorder which they brought to the room.

At the completion of both the andragogy and pedagogy sessions, the Participant Survey Form were distributed. On the Participant Survey Form, trainers were reminded to put their name on the "Trainer" line, and reminded the participants to put their number in the participant number line. The trainers name on the form enabled the researcher to determine whether the participants were in an andragogical or pedagogical training session. The participants answered the questions specifically with the module on "Selecting The Right Person for the Job" in mind. Immediately after the participants completed the forms the trainers collected them. After collecting the forms, the normal OTS schedule and practices were resumed until the end of the day.

At the end of the day, the measure of Objective Learning was distributed by the trainers, and collected after allowing sufficient time for completion (15-20 minutes was usually more than enough time). Some precautions were taken regarding the measure of objective learning. To avoid sensitizing certain individuals or groups, the trainers were warned against refering to the fact that the participants would be taking a learning measure or a "test" after the session. Also the trainers were asked to stress the importance of having the participants take their time in filling out the measure, and to again thank them for their participation in the research project. The trainers were asked to keep the participants from hurrying through this most important measure.

Finally, after collecting all the measures, the trainers debriefed the participants. Some variation of the following was suggested:

> We're very grateful for your cooperation in the research that has been going on. As we mentioned earlier, this research is an attempt to determine whether certain types of individual personality differences influence learning styles, and whether these preferred learning styles influence the effectiveness of various types of training. The ultimate objective is to apply the findings so that we could make TVA's training as effective as possible for every individual in every training program. The data gathering for this project will continue until mid-March, so we ask that if you know anyone who is going to attend this OTS seminar, please do not discuss the research or

any of the measures with them. If you are interested in finding out more about the results of the analyses of these data, give me your name and TVA address, or contact Rick Cartor at GUB 5W170C-K, or call 632-8948. Are there any questions about the research? Again, thanks for your participation.

After collecting the 7 measures from all participants, the trainers were asked to either mail, or deliver all forms and audio tapes to the researcher. All the forms and tapes were then stored in appropriately marked folders until all data collection was completed. After all the data were collected, the preliminary steps were taken to prepare the data for analysis.

5. Analysis

Tests of internal consistency (coefficient alpha) were computed to determine the reliability of the scales used. Descriptive statistics (mean, standard deviation, and range) and inter-correlations among the scales, as well as multiple regressions and analyses of variance were conducted and reported. Also assessed and reported were the data regarding the inter-rater agreement on the Measure of Ego Development, and the manipulation check on the differences in the execution of the training types.

The Statistical Package for Social Sciences (SPSS) was used for all data analyses. Missing data were excluded from the correlation and regression analyses.

CHAPTER IV

RESULTS

The results from the study are reported in this chapter. The differences in the training types are presented, as are data regarding the inter-rater agreement on the measure of Ego Development. Also provided are the descriptive statistics and psychometric properties of the measures used in the study, and the results of the data analyses used to test the hypotheses postulated in Chapter Two.

1. Manipulation Check

As a manipulation check, the two types of training sessions on "selection" were audio-taped to assess the percent of "oneway communication" (i.e., the amount of lecture time) that was taking place. The audio taping also allowed for a rough count of the number of discussion comments offered by participants during the training session.

A rater listened to the audio tape of each taped session with a stopwatch, and timed the total amount of time that the trainer spent talking. The stopwatch was stopped during periods of participant questions, comments, answers, during the viewing of the videotape, and during group discussion time. The total of the oneway, or information delivery time, was then divided by the total elapsed time of the module to derive a percentage of oneway

communication. The rater also tallied the number of questions and comments offered by the participants in the session. The results of this audio assessment are presented in Table IV.1.

Table IV.1
Manipulation Check:
A Comparison of the Andragogy and Pedagogy Sessions

Trainer#	Date	Minutes of lecture	Total time of session	%Oneway Communication	#Comments
Pedagogy Sessions					
1	2/12/88	70.33	93.00	75.6	19
2	1/27/88	80.50	86.00	93.6	20
3	3/11/88	87.33	93.00	93.9	26
2	2/15/88	51.00	59.00	86.4	27
	Means:	72.29	82.75	87.36	23.0
Andragogy Sessions					
4	1/22/88	49.16	100.00	49.18	100
5	1/27/88	45.50	95.00	47.81	91
5	2/12/88	33.50	69.00	48.55	49
5	2/15/88	51.80	102.00	50.78	123
4	3/11/88	46.00	92.00	50.00	84
	Means:	45.19	91.60	49.33	89.4

Due to logistical difficulties, audio tapes were not available for all of the sessions that were conducted. Also, due to problems with the equipment, not all of the sessions which were taped were taped in their entirety. Despite these problems, a review of the table indicates that the trainers were effective in achieving

differences in the amount of time which was spent in one-way, or lecture style communication. The pedagogical trainers spent an average of 87% of their time delivering information and speaking before the group, while the andragogical training group averaged less then 50% of the session time lecturing the group. Similarly, the andragogical trainers averaged over 100 questions and/or participant comments, while the sessions led by pedagogical trainers averaged only 23 questions and comments. These results suggest, based on the criteria of percent of oneway communication and the amount of learner participation generated, that the trainers were effective in achieving differences between the two training types.

2. Inter-rater Agreement on The Measure of Ego Development

Loevinger's (1976) Measure of Ego Development is a 36-item sentence completion test which requires scoring by experienced raters. Each item is scored individually, then a total protocol rating (TPR) is derived based on the ratings of the individual items.

One rater rated all 36 items for all 213 participants. To get a measure of the degree of accuracy of the primary rater's scoring, a second rater was recruited to rate the 36-item protocols of 20 randomly selected subjects from the pool of 213 research participants. Each of the raters had been familiar with Loevinger's Measure of Ego Development for over 10 years.

Rating the Practice Items

Before rating the actual protocols, steps were taken to allow both the primary and secondary raters the opportunity to practice their item-rating skills. Loevinger (1976) provides practice items derived from real protocols, along with the correct rating of the items and the correct Total Protocol Rating (TPR). The primary rater and secondary rater separately rated ten 36-item practice tests, and derived each of the 10 Total Protocol Ratings. The results of the two rater's practice sessions were then compared to each other, and were compared to the results of the correct ratings provided in the back of the practice book.

The primary and secondary raters each rated 360 total practice items, (ten 36-item protocols) and these 360 item ratings were then compared to each other and to the correct ratings as reported by Loevinger (1976). A percentage of agreement was derived by dividing the total number of items rated the same, by the total number of items to be rated (i.e., 360).

Also compared were the TPR ratings of the two raters with the correct TPR ratings provided by Loevinger (1976). In this instance, the raters TPR's were compared with each other, and each with Loevinger's (1976) correct TPR's, and a percentage of agreement was derived. Again, the percentage of agreement was derived by dividing the total number of practice protocols rated the same, by the total number of practice protocols to be rated (i.e., 10).

Loevinger (1976) points out the difficulty in assessing certain half-step differences on items, and addresses the fact that these half-step differences often have little bearing on the TPR score. An example of a half-step difference would be when a rater rates a response as an I-3, when in fact the response was at the I-3/4 level. The I-3/4 rating indicates that the respondent is at a level between I-3 and I-4, and thus a rating of either I-3 or a I-4 for this individual's response should be considered one-half step off. If a reponse were rated as I-3, when in fact it was I-4, then that would be considered as being a full step off. Loevinger (1976) suggests that when assessing inter-rater agreement, the information regarding exact, half-step, and full step accuracy be provided. Using this convention, the results of the assessment of inter-rater agreement appear in Table IV.2.

Table IV.2.
Percent of Inter-rater
Agreement on the Ego development Practice Items

Percentage of Agreement	Exact	1/2 step	1 step
360 Item Ratings:			
Rater #1 and correct answers	86.67	95.55	99.17
Rater #2 and correct answers	83.33	94.72	98.61
Rater #1 and Rater #2	84.44	93.01	98.01
10 Total Protocol Ratings:			
Rater #1 and correct answers	90	100	100
Rater #2 and correct answers	80	100	100
Rater #1 and Rater #2	90	100	100

Rating the Research Items

The inter-rater agreement for the actual use of the Measure of Ego Development for the research was also assessed. The primary rater rated all 213 measures, while the secondary rater rated twenty of the 36-item tests. The tests which the secondary rater scored were randomly selected from the total group of ego development measures. The secondary rater rated each of the 720 items (twenty 36-item tests) and also derived 20 total protocol ratings. Table IV.3 provides the data regarding the inter-rater agreement on the ratings of the Measure of Ego Development used for the research. The same method for deriving the percentage of inter-rater agreement on the research items as in determining the percentage of inter-rater agreement on the practice items was used. Also, the exact agreement, 1/2 step agreement, and one step convention was also used. The table shows that the rater agreement was exact on 85.3% of the items, was within 1/2 step on 94.2% of the ratings, and the raters were within one step on 97.7% of the ratings. On the TPR's, inter-rater agreement was in exact agreement on 85% of the participants, and within 1/2 step on 100% of the 20 participants tests. These results are very similar to, though slightly better, those which Loevinger (1976) reports that one should expect between trained raters.

Table IV.3
Percent of Inter-rater
Agreement on the Ego development Research Items

Percentage of Agreement	Exact	1/2 step	1 step
720 Item Ratings:			
Rater #1 and Rater #2	85.30	94.20	97.70
20 Total Protocol Ratings:			
Rater #1 and Rater #2	85	100	100

3. Descriptive Statistics and Psychometric Properties of the Measures

Descriptive statistics for all the variables used in the study, along with internal consistency estimates of reliability (coefficient alpha) for each measure, are presented in Table IV.4. The intercorrelations among the major variables in this study are presented in Table IV.5. The intercorrelations among the major variables in this study, within each training type, are presented in Table IV.6.

Table IV.4
Descriptive Statistics and Coefficient Alpha
Reliability Estimates for Measures in the Study

Variable (# of items)	N	Central Tendency(a)	Standard Deviation(b)	Actual Range(c)	alpha
Learning Style Inventory					
CE (12)	187	25.60	8.22	12-47	.85
RO (12)	187	31.33	7.77	14-48	.86
AC (12)	187	31.96	7.64	13-48	.86
AE (12)	187	32.04	7.89	14-48	.86
Locus of Control (23)	210	6.90	3.77	00-19	.75
California Psychological Inventory					
Ach-Conformity (38)	212	30.72	3.52	20-38	.60
Ach-Independ. (32)	210	21.20	3.74	11-30	.61
Ego Development (36)	204	3/4	N/A	2-5	N/A
Objective Learning (15)	207	11.45	1.91	04-15	.43
Participant Survey Form					
Satisfaction (12)	194	62.81	5.79	41-72	.90
Reported Learning(6)	194	29.04	3.60	15-36	.84

a. Central tendency for the LSI represents the mean of column totals. For Ego Development, reported central tendency is the mode. All other central tendencies are means.

b. Standard deviations and alpha reliabilities are not applicable for the ordinal classification system used in the Measure of Ego Development.

c. Reported ranges for the LSI and PSF are the sums of the forced choice scores for the items comprising the variable. Range for the Measure of Ego Development is the range of the Total Protocol Ratings.

Table IV.5
Zero-Order Pearson Correlation
Coefficients Among Measures in the Study.

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Locus of Control	--	-.09	-.10	-.16*	-.14*	-.01	.06	.00	-.04	-.17**	.13*
2. Active-Reflective		--	-.09	.01	.00	-.06	-01	.01	.04	-.09	-.07
3. Abstract-Concrete			--	.01	.12*	.11	.16*	.12*	.08	-.11	.16**
4. Achievement-Conformity				--	.24***	.14*	.06	.19**	.23***	-.06	.19**
5. Achievement-Independence					--	.05	.32***	-.09	-.17**	-.23***	.29***
6. Ego Development						--	.20**	.12*	.17**	-.08	.15*
7. Objective Learning							--	-.10	-.05	-.28***	.20**
8. Satisfaction								--	.69***	.10	-.08
9. Self-Reported Learning									--	.05	-.13*
10. Age										--	-.24***
11. Education											--

* $p < .05$
** $p < .01$
*** $p < .001$

Table IV.6
Zero-Order Pearson Correlation
Coefficients Among the Measures in the
Andragogy and Pedagogy Training Types[a]

Variable	1	2	3	4	5	6	7	8	9	10	11
							Pedagogy				
1. Locus of Control	--	-.12	-.26**	-.13	-.19*	-.05	-.07	.02	.02	-.09	.10
2. Active-Refelctive	-.06	--	-.18*	.05	.00	-.07	.02	.05	.11	-.11	-.12
3. Abstract-Concrete	.06	-.03	--	-.05	.02	.07	.05	.27**	.21*	-.02	.16
4. Achievement-Conformity	-.15	.00	.11	--	.27**	.15	.07	.22*	.16	-.03	.17*
5. Achievement-Independence	.00	.01	.31***	.19*	--	-.06	.38***	-.07	-.22*	-.28**	.21*
6. Ego Development	.00	-.03	.18*	.15	.17	--	.19*	.11	.23*	.07	.12
7. Objective Learning	.22*	-.06	.28**	.06	.29**	.19	--	-.09	.02	-.09	.15
8. Satisfaction	-.06	-.01	-.04	.19*	-.06	.15	-.12	--	.76***	.09	-.07
9. Self-Reported Learning	-.14	-.04	-.11	.34***	-.10	.05	-.22*	.65***	--	.09	-.18*
10. Age	-.25**	-.11	-.13	-.09	-.18*	-.23*	-.48***	.10	.02	--	-.15
11. Education	.20*	-.01	.14	.21*	.38***	.19*	.23*	-.09	-.09	-.30***	--
	Andragogy										

a. Figures in the top right section of the matrix are correlations within the pedagogy condition, figures in the bottom left section of the matrix are correlations within the andragogy condition.

* $p < .05$
** $p < .01$
*** $p < .001$

4. Tests Of The Hypotheses

Hypothesis 1

In hypotheses 1a, 1b, 1c, 1d, it was hypothesized that the group of individuals who were classified as active learners by Kolb's LSI (1981) would have lower average Locus of Control scores, higher Achievement-Independence scores, lower Achievement-Conformance scores, and higher Ego Development scores. To test these hypotheses, four oneway analyses of variance were conducted by separating the groups into active and reflective learners, then comparing the group means on the four dependent variables. The results of this analysis are presented in Table IV.7 and are discussed below.

In Hypothesis 1a it was predicted that individuals whose learning styles were classified as "active", would have lower Locus of Control scores than would individuals whose learning styles were classified as "reflective". An analysis of variance comparing the mean Locus of Control score for active learners (M = 6.80, S.D. = 3.73) with the mean Locus of Control score for the reflective learners (M = 6.84, S.D. =3.96) revealed no significant difference between the two groups (F = .01, n.s.). Therefore, Hypothesis 1a was not supported.

In Hypothesis 1b it was predicted that individuals whose learning styles were classified as "active", would have higher

Table IV.7
Means and Standard Deviations for the Dependent Variables of Hypotheses 1a, 1b, 1c, and 1d

Dependent Variable	Active Learners N	Mean	SD	Reflective Learners N	Mean	SD	F
Locus of Control	91	6.80	3.73	108	6.84	3.96	.01
Achievement-Conformance	91	30.62	3.71	108	30.79	3.49	.13
Achievement-Independence	90	21.32	3.67	107	21.37	3.68	.01
Ego Development	89	3.72	1.2	102	3.84	.96	.63

Achievement-Independence scores, as measured by the CPI, than would individuals whose learning styles were classified as "reflective". An analysis comparing the mean Achievement-Independence score for active learners (M = 21.32, S.D. =3.67) with the mean Achievement-Independence score for the reflective learners (M = 21.37, S.D. =3.68) revealed no significant difference between the two groups (F = .01, n.s.). Therefore, Hypothesis 1b was not supported.

In Hypothesis 1c it was predicted that individuals whose learning styles were classified as "active", would have lower Achievement-Conformance scores, as measured by the CPI, than would individuals whose learning styles were classified as "Reflective". An analysis comparing the mean Achievement-Conformance score for active learners (M = 30.62, S.D. = 3.71) with the mean Achievement-Independence score for the reflective

learners (M = 30.79, S.D. = 3.49) revealed no significant difference between the two groups (F = .13, n.s.). Therefore, Hypothesis 1c was not supported.

In Hypothesis 1d it was predicted that individuals whose learning styles were classified as "active", would have higher Ego Development scores, as measured by Loevinger's Measure of Ego Development, than would individuals whose learning styles were classified as "reflective". An analysis comparing the mean Ego Development score for active learners (M = 3.72, S.D = 1.2) with the mean Ego Development score for the reflective learners (M = 3.84, S.D = .96) revealed no significant difference between the two groups (F = .63, n.s.). Therefore, Hypothesis 1d was not supported.

Hypotheses 2a, 2b, 2c.

It was predicted in Hypothesis 2 that individuals with active learning styles would demonstrate: (a) more learning (i.e., higher average Objective Learning scores), (b) would report more learning (have higher Self-Reported Learning scores), and (c) would report more positive reactions (higher average Satisfaction scores) in the andragogy sessions (i.e., congruent training) than will individuals with the active learning style who are exposed to the pedagogy condition (i.e., incongruent training).

Three oneway analyses of variance were conducted to test these hypotheses. In these analyses only those individuals classified as "active" learners were selected for analysis. Thus, the

dependent variables for those active learners who had been exposed to the andragogy training (congruent) session were compared to the active learners who had been exposed to the pedagogy training (incongruent) session. The results of these analyses appear in Table IV.8.

Table IV.8
Means and Standard Deviations for Hypotheses 2a, 2b, 2c:
Active learners exposed to Pedagogy Compared with
Active Learners exposed to Andragogy.

Dependent Variable	Andragogy N	Andragogy Mean	Andragogy SD	Pedagogy N	Pedagogy Mean	Pedagogy SD	F
Objective Learning Score	37	11.51	1.92	45	11.62	1.57	.08
Satisfaction	37	5.22	.58	47	5.32	.48	.67
Self-Reported Learning	37	4.91	.66	47	4.88	.49	.05

An analysis comparing the mean Objective Learning score for active learners exposed to the andragogical training ($\underline{M}$ = 11.51, $\underline{S.D}$ = 1.92) was compared to the mean score for active learners exposed to the pedagogical training ($\underline{M}$ = 11.62, $\underline{S.D}$ = 1.57). The comparison revealed no significant difference between the two groups ($\underline{F}$ = .08, n.s.). Therefore, Hypothesis 2a was not supported.

The mean Self-Reported Learning score for active learners exposed to the andragogical training ($\underline{M}$ = 4.91, $\underline{S.D}$ = .66) was compared to the mean score for active learners exposed to the

pedagogical training (M = 4.88, S.D = .49). The comparison revealed no significant difference between the two groups (F = .05, n.s.). Therefore, Hypothesis 2b was not supported.

An analysis comparing the mean Satisfaction score for active learners exposed to the andragogical training (M = 5.22, S.D = .58) was compared to the mean score for active learners exposed to the pedagogical training (M = 5.32, S.D = .48). The comparison revealed no significant difference between the two groups (F = .67, n.s.). Therefore, Hypothesis 2c was not supported.

Hypotheses 3a, 3b, 3c.

It was predicted in Hypothesis 3 that individuals with active learning styles would demonstrate more learning (i.e., have higher average Objective Learning scores), would report more learning (i.e., higher average Self-Reported Learning scores), and would report more positive reactions (higher average Satisfaction scores) in the andragogy sessions (i.e., congruent training) than will individuals with the reflective learning style who are exposed to the andragogy condition (i.e., incongruent training).

Three separate oneway analyses of variance were conducted, one for each dependent vairables. In each case, only the participants who attended the andragogy training session were selected for analysis. Thus, the group means on the dependent variables for reflective learners were compared to the group means for the active learners. The results of these analyses appear in Table IV.9.

Table IV.9
Means and Standard Deviations for Hypotheses 3a, 3b, and 3c:
Active Learners Versus Reflective Learners exposed to Andragogy

Dependent Variable	Active Learners N	Mean	SD	Reflective Learners N	Mean	SD	F
Objective Learning Score	45	11.62	1.57	51	11.61	1.91	.00
Satisfaction	47	5.32	.48	51	5.26	.35	.41
Self-Reported Learning	47	4.88	.50	51	4.93	.45	.22

An analysis comparing the mean Objective Learning score for active learners exposed to the andragogical training (M = 11.62, S.D = 1.57) was compared to the mean score for reflective learners exposed to the andragogical training (M = 11.61, S.D =1.91). The comparison revealed no significant difference between the two groups (F = .00, n.s.). Therefore, Hypothesis 3a was not supported.

The mean Self-Reported Learning score for active learners exposed to the andragogical training (M = 4.88, S.D = .50) was compared to the mean score for reflective learners exposed to the andragogical training (M = 4.93, S.D = .45). The comparison revealed no significant difference between the two groups (F = .22, n.s.). Therefore, Hypothesis 3b was not supported.

An analysis comparing the mean Satisfaction score for active learners exposed to the andragogical training (M = 5.32, S.D. = .48) was compared to the mean score for reflective learners exposed to the andragogical training (M = 5.26, SD = .35). The comparison

revealed no significant difference between the two groups (F = .41, n.s.). Therefore, Hypothesis 3c was not supported.

Hypotheses 4a, 4b, 4c.

It was predicted in Hypothesis 4 that individuals with reflective learning styles would demonstrate more learning (i.e., have higher average Objective Learning scores), would report more learning (i.e., higher average Self-Reported Learning scores), and would report more positive reactions (higher average Satisfaction scores) in the pedagogy sessions (i.e., congruent training) than will individuals with the reflective learning style who were exposed to the andragogy condition (i.e, incongruent training).

Three oneway analyses of variance were conducted to test these hypotheses. Only those individuals classified as "reflective" learners were selected for analysis. Thus, the dependent variables for those reflective learners who had been exposed to the andragogy training session were compared to the reflective learners who had been exposed to the pedagogy training session. The results of these analyses appear in Table IV.10.

An analysis comparing the mean objective learning score for the reflective learners exposed to the pedagogical training (M = 11.44, S.D. = 2.1) was compared to the mean score for reflective learners exposed to the andragogical training (M = 11.61, S.D. = 1.91). The comparison revealed no significant

difference between the two groups (F= .17, n.s.). Therefore hypotheseis 4a was not supported.

Table IV.10
Means and Standard Deviations for Hypotheses 4a, 4b, 4c:
Reflective Learners exposed to Pedagogy Compared with
Reflective Learners exposed to Andragogy

Dependent Variable	Andragogy N	Mean	SD	Pedagogy N	Mean	SD	F
Objective Learning Score	51	11.61	1.91	54	11.44	2.1	.17
Satisfaction	51	5.26	.35	55	5.16	.52	3.88
Self-Reported Learning	51	4.93	.45	55	4.71	.66	1.36

The mean Self-Reported Learning score for reflective learners exposed to the pedagogical training (M = 4.71, S.D. =.66) was compared to the mean score for reflective learners exposed to the andragogical training (M = 4.93, S.D. = .45). The comparison revealed no significant difference between the two groups (F = 1.36, n.s.). Therefore Hypothesis 4b was not supported.

An analysis of variance comparing the mean Satisfaction score for reflective learners exposed to the pedagogical training (M = 5.16, S.D. = .52) was compared to the mean score for reflective learners exposed to the andragogical training (M = 5.26, S.D. = .35). The comparison revealed no significant difference between the two groups (F = 3.88, n.s.). Therefore Hypothesis 4c was not supported.

Hypotheses 5a, 5b, 5c

It was predicted in Hypothesis 5 that individuals with reflective learning styles would demonstrate: (a) more learning (i.e, higher average Objective Learning scores), (b) would report more learning (have higher Self-Reported Learning scores), and (c) would report more positive reactions (higer average Satisfaction scores) in the pedagogy sessions (i.e., congruent training) than will individuals with the active learning styles who are exposed to the pedagogy condition (i.e., incongruent training).

Three separate oneway analyses of variance were conducted, one for each dependent vairables. In each case, only the participants who attended the pedagogy training session were selected for analysis. Next, the group means on the dependent variables for reflective learners were compared to the group means for the active learners. The results of these analyses appear in Table IV.11.

An analysis comparing the mean Objective Learning score for reflective learners exposed to the pedagogical training (M = 11.44, S.D. = 2.1) was compared to the mean score for active learners exposed to the pedagogical training (M = 11.51, S.D. = 1.92). The comparison revealed no significant difference between the two groups (F = .03, n.s.). Therefore, Hypothesis 5a was not supported.

The mean Self-Reported Learning score for reflective learners exposed to the pedagogical training (M = 4.71, S.D. = .66) was

compared to the mean score for active learners exposed to the pedagogical training (M = 4.91, S.D. = .66). The comparison

Table IV.11
Means and Standard Deviations for Hypotheses 5a, 5b, and 5c:
Active Learners versus Reflective Learners exposed to Pedagogy

Dependent Variable	Active Learners N	Mean	SD	Reflective Learners N	Mean	SD	F
Objective Learning Score	37	11.51	1.92	54	11.44	2.10	.03
Satisfaction	37	5.22	.58	55	5.16	.52	.28
Self-Reported Learning	37	4.91	.66	55	4.71	.66	2.05

revealed no significant difference between the two groups (F = 2.05, n.s.). Therefore Hypothesis 5b was not supported.

An analysis of the mean Satisfaction score for reflective learners exposed to the pedagogical training (M = 5.16, S.D. = .52) was compared to the mean score for active learners exposed to the pedagogical training (M = 5.22, S.D. = .58). The comparison revealed no significant difference between the two groups (F = .28, n.s.). Therefore Hypothesis 5c was not supported.

5. Additional Analyses

Methods of statistical analysis which were not originally proposed were conducted to further explore the data. An assessment of Hypotheses 2 through 5 was performed by conducting 2x2x2 Analyses of Variance with objective learning

score, reported satisfaction, and self-reported learning as the dependent variables. The 2x2x2 Analyses of Variance was performed using the two training types, and splitting the learning style independent variables (Active-Reflective and Abstract-Concrete) at the sample medians (versus the tests' prescribed quadrant cut-offs). This step was taken due to the disparity between the quadrants cutoff prescribed by Kolb's (1981) LSI, and the samples' medians on the Active-Reflective and Abstact-Concrete dimensions. This allowed for an analysis of the relative, sample dependent effects of learning style.

Zero-order Pearson correlation coefficientes were derived for the Active-Reflective scores with the three dependent measures, within each training type. Also, multiple linear regressions were conducted with the three dependent measures, using Active-Reflective scores, training type, and the interaction of Active-Reflective scores and training type as the independent variables in the regression equation.

Multiple linear regressions were also conducted to assess the degree to which the independent variables and demographic variables impacted the dependent variables.

The 2x2x2 Analyses of Variance

Three separate 2x2x2 Analyses of Variance were conducted, using the two training types, and splitting the learning style independent variables (Active-Reflective and Abstract-Concrete) at the sample medians (versus the tests' prescribed quadrant cut-

offs). This step was taken due to the disparity between the quadrants cutoff prescribed by Kolb's (1981) LSI, and the samples' medians on the Active-Reflective and Abstact-Concrete dimensions. This allowed for an analysis of the relative, sample dependent effects of learning style. Table IV.12 shows the cell sizes for each quadrant before and after the median split.

Table IV.12
LSI Cell Sizes Before and After the Median Split

	N	
Learning Style	Before	After
Active & Concrete	45	48
Active & Abstract	47	53
Reflective & Concrete	40	45
Reflective & Abstract	69	55
Totals	201	201

The 2x2x2 Analyses of Variance with the active-reflective and concrete-abstract variables split at the sample median, by training type, with Objective Learning Score as the dependent variable, produced no statistically significant main effects. The two-way and three-way interactions also were not statisitcally significant. The results of this analysis appear in Table IV.13.

The 2x2x2 Analyses of Variance with the active-reflective and concrete-abstract variables split at the sample median, by training type, with Self-Reported Learning as the dependent

variable, produced no statistically significant main effects. The two-way and three-way interactions also were not statistically significant. The results of this procedure appear in Table IV.14.

Table IV.13
2x2x2 Analysis of Variance
with Objective Learning Score as the Dependent Variable

Source	SS	DF	MS	F	P
Main Effects	9.94	3	3.31	.89	.45
ACTIVE/REFLECTIVE	.17	1	.17	.05	.83
ABSTRACT/CONCRETE	8.90	1	8.90	2.40	.12
TRAINING TYPE	1.34	1	1.34	.36	.55
2-Way Interactions	3.74	3	1.25	.34	.80
ACTIVE x ABSTRACT	.38	1	.38	.10	.75
ACTIVE x TTYPE	1.71	1	1.71	.46	.50
ABSTRACT x TTYPE	1.40	1	1.40	.37	.54
3-Way Interaction	9.31	1	9.31	2.50	.12
ACTIVE x ABSTRACT x TTYPE	9.31	1	9.31	2.50	.12
Explained	22.98	7	3.28	.88	.52
Residual	706.44	190	3.72		
Total	729.42	197	3.70		

Table IV.14.
2x2x2 Analysis of Variance with
Self-Reported Learning as the Dependent Variable

Source	SS	DF	MS	F	P
Main Effects	1.15	3	.38	1.07	.36
ACTIVE/REFLECTIVE	.04	1	.04	.12	.73
ABSTRACT/CONCRETE	.70	1	.70	1.94	.16
TRAINING TYPE	.46	1	.46	1.27	.26
2-Way Interactions	1.15	3	.38	1.10	.36
ACTIVE x ABSTRACT	.26	1	.26	.74	.39
ACTIVE x TTYPE	.35	1	.35	.98	.32
ABSTRACT x TTYPE	.65	1	.65	1.82	.18
3-Way Interaction	.16	1	.16	.44	.50
ACTIVE x ABSTRACT x TTYPE	.16	1	.16	.44	.50
Explained	2.46	7	.35	.98	.45
Residual	69.44	194	.36		
Total	71.90	201	.36		

The 2x2x2 Analyses of Variance with Satisfaction as the dependent variable resulted in a statistically significant main effect for the Abstract-Concrete learning style ($F = 4.65$, $p = .03$). The mean satisfaction score for the group above the median (i.e., the abstact learners) was 5.3, for the group classified as concrete learners, the mean satisfaction score was 5.16. The other variables, Active-Reflective and training type, resulted in no statistically significant main effects, and no significant two or

three-way interactions were evident. The results of this analysis appear in Table IV.15.

Table IV.15
2x2x2 Analysis of Variance with
Satisfaction as the Dependent Variable

Source	SS	DF	MS	F	P
Main Effects	1.68	3	.56	2.41	.07
ACTIVE/REFLECTIVE	.05	1	.05	.23	.63
ABSTRACT/CONCRETE	1.07	1	1.07	4.65	.03
TRAINING TYPE	.60	1	.60	2.60	.11
2-Way Interactions	.17	3	.06	.24	.87
ACTIVE x ABSTRACT	.08	1	.08	.35	.55
ACTIVE x TTYPE	.04	1	.04	.17	.68
ABSTRACT x TTYPE	.03	1	.03	.14	.71
3-Way Interaction	.29	1	.29	1.25	.26
ACTIVE x ABSTRACT x TTYPE	.29	1	.29	1.25	.26
Explained	2.12	7	.30	1.31	.24
Residual	44.82	194	.23		
Total	46.95	201	.23		

Multiple Linear Regression to Assess the Moderating Effects of Training Type

To assess whether training type was functioning as a moderator variable in the relationship between the active-reflective learning style and the dependent variables, separate

zero-order Pearson correlation coefficients were derived for each training type. The correlations between the Active-Reflective learning style scores (treated as continuous variables) and the three dependent variables computed within each training type are shown in Table IV.16. Also shown are the Beta weights for the interaction term, from the multiple linear regressions which were conducted with the three dependent variables, using Active-Reflective scores, training type, and the interaction of Active-Reflective scores and training type as the variables in the regression equation. These results indicate that training type was not a moderator variable in the correlations between the outcome variable and the Active-Reflective learning style.

Table IV.16
Zero-Order Pearson Correlation Coefficients and Interaction Beta Weights for Active-Reflective Scores

Dependent Variable	Active-Reflective Scores: Andragogy	Pedagogy	BETA[a]	F[b]
Objective Learning	-.06	.02	-.18	.25
Satisfaction	-.01	.05	-.16	.19
Self-Reported Learning	-.04	.11	-.39	1.11

a. Reported Beta weights represent the Beta Weights for the interaction of the Active-Reflective Score and Training type, when the interaction variable is entered into a multiple regression analysis on the dependent variable.

b. Reported F ratios represent the F ratios associated with the Active-Reflective/Training type interaction variable after entry into the multiple regression analysis on the dependent variable.

Multiple Linear Regression

Multiple regression analyses were conducted to discern which variables most impacted the dependent variables, and to assess the extent to which these variables influenced the dependent variables. The multiple regression analyses were performed using a forward selection procedure. In the forward format, variables are entered into the regression equation based on their degree of correlation (whether positive or negative) with the dependent variable. If the first variable meets the criterion for inclusion ($p < .05$), forward selection continues, and the next variable with the largest partial correlation from among the variable candidates is selected. The forward selection format was selected as the preferable multiple regression analysis procedure since it would allow for the determination of the variables that account for the greatest unique variance in the dependent variables.

The first regression was conducted with Objective Learning Scores as the dependent variable. The summary of the results appear in Table IV.17.

Demographic information on the candidates was included along with the independent variables in the regression equation. The Independent-Achievement score from the CPI, the ego development score, and the participants age were the variables which were found to most significantly account for the variation in Objective Learning scores ($r = .31$, .22, and -.25, respectively, raising the Multiple R from .31, to .37, to .40). The Independent-Achievement score and the ego development score were

positively correlated with Objective Learning scores, while participant age correlated in a negative direction. A regression analysis using the stepwise format produced identical results.

Table IV.17
Regression Analysis of the Demographic and Independent Variables on Objective Learning Score.

Summary Table

Step	Variable	R	F(Egn)	RsqCh	Fch	BetaIn	Corr
1	Achievement -Independent	.31	18.95***	.098	18.95***	.31	.31
2	Ego Development	.37	13.78***	.039	7.85**	.20	.22
3	Age	.40	11.11***	.025	5.12*	-.16	-.25

* p< .05
** p < .01
*** p < .001

A multiple regression was run with self-reported learning as the dependent variable. The result of this analysis detected statistically significant relationships between Self-Reported Learning and Achievement-Conformance, Independent-Achievement, ego development score score, and the participants education level. The Achievement-Conformance and ego development scores were positively correlated with Self-Reported Learning (.25 and .18, respectively) while Independent-Achievement and the participants education level showed a negative correlation with Self-Reported Learning (-.16, and -.13). The summary table results of this analysis appear in Table IV.18.

Finally, a regression analysis was conducted using satisfaction as the dependent variable. This analysis resulted in the selection of only one statistically significant variable, that being Achievement-Conformance (r = .22, p = .00).

Table IV.18
Regression Analysis of Demographic and
Independent Variables on Self-Reported Learning.

Summary Table

Step	Variable	R	F(Egn)	RsqCh	Fch	BetaIn	Corr
1	Achievement-Conformity	.25	12.08	.06	12.08	.25	.25
2	Achievement-Independent	.34	11.50	.05	10.28	-.23	-.16
3	Ego Development	.37	9.34	.02	4.53	.15	.18
4	Education	.40	8.32	.02	4.69	-.16	-.13

6. Summary

None of the 16 hypotheses which were analyzed by conducting separate Analyses of Variance detected statistically significant differences in group means on the dependent variables. Three separate 2x2x2 Analyses of Variance, with Objective Learning Score, Satisfaction, and Self-Reported Learning as the dependent variables were conducted. These analyses yielded only one statistically significant result, that being the effect of

Abstract-Concrete learning style on satisfaction. Individuals above the sample median in abstract learning reported more satisfaction with both training types, than did the individuals who were classified as concrete learners. The Abstract-Concrete learning style continuum produced other interesting, though not statistically significant, influences on the dependent variables, and these will be discussed in the next section.

A series of multiple linear regressions were conducted to further explore the relationships between the independent, demographic, and dependent variables. These analyses indicated that Independent-Achievement scores, the ego development scores, and the participants ages (through a negative correlation) were the variables most significantly related to variation in Objective Learning scores. For self-reported learning, Achievement-Conformance and ego development scores were positively correlated with self-reported learning, while the Achievement-Independence scores and the participants education level were correlated negatively with SRL. Achievement-Conformance was the only variable which was statistically significant in accounting for the variance in satisfaction scores.

CHAPTER V

DISCUSSION

The objectives of this study were to assess whether certain individual personality differences could account for differences in preferred learning styles, and to examine whether preferred learning styles could account for the effectiveness of, and the reactions to, different types of training methods. Also assessed were the relationships between the individual personality measures and the participants satisfaction, objective learning, and self-reported learning after exposure to the training programs. These three relationships (the individual difference measures and the learning styles, the learning styles and the training type outcomes, and the individual difference measures and the training type outcomes) are discussed below.

1. Discussion of Findings

The first hypothesis tested the extent to which learning styles were related to key personality constructs. Specifically, it was hypothesized that individuals with active learning styles would have a more internal locus of control, would have higher achievement-independence scores, would have lower achievement-conformance scores, and would have higher ego

development scores. Tests of these hypotheses demonstrated an absence of the predicted relationships. There appeared to be no pattern between the measures of individual differences and the participants active or reflective learning styles, as indicated by the low, non-significant correlations of the AE-RO variable in Table IV.5.

One non-hypothesized result that did emerge was the relationship which the Abstract-Concrete learning style had with Independent-Achievement scores. AC-CE correlated significantly ($r = .12$, $p < .05$) with individuals Independent-Achievement scores, as shown in Table IV.5. While the lack of a relationship between AE-RO and the personality measures might show either that the predicted relationship does not exist, or that a relationship was not detected in the current study, the relationship between AC-CE and Achievement-Independent might be open to several interpretations. One explanation, of course, is that, by chance, it emerged as a statistically significant relationship. Another interpretation is that the AC-CE score, which according to Kolb (1981) indicates a preference for the systematic application of logic and ideas rather than feelings, theory-building, and conceptualization, measures the individual's personal, independent, intra-psychic efforts to make sense of ones own world and experiences. This individualistic striving could explain why individual high in abstract conceptualization might also score high on the measure of Independent Achievement, in which high scores indicate foresightedness, independence, self-reliance, and superior intellectual ability and

judgement. Conversely, individuals preferring the concrete experience learning style rely more on feelings than on a systematic approach to problems, and rely on their ability to be open minded and adaptable to change. This learning orientation was associated with the lower scores on Independent Achievement, of which low scores are reported to indicate individuals who are inhibited, cautious, submissive, and compliant.

These results might suggest either that an individuals level of achievement drive, as measured by the Achievement-Independent scale of the CPI, greatly influences their abstract or concrete approach to learning or that the two measures may be assessing the same, or a very similar construct.

The second set of relationships which were analyzed were those between the learning styles (particularly the active-reflective dimension) and the outcome measures after exposure to one of two training types. It was hypothesized that individuals would benefit more (i.e., report higher satisfaction and more learning, as well as perform better on a test of objective learning) from training types which were congruent with their learning style than from those which were incongruent. Congruent situations existed when andragogical training was used for the active learners, and pedagogical training was used for the reflective learners. At this stage of the assessment, none of the demographic or descriptive variables were included in the statistical analysis.

The analyses indicated that none of the predicted relationships between learning styles and training types, and the outcome measures of objective learning, satisfaction, or self-reported learning, were significant. The active-reflective dimension of Kolb's LSI (1981) did not relate to any predicted differences in group means in any of the dependent measures after exposure to the two different training types.

An interesting result however, was that again the abstract-concrete dimension of Kolb's LSI (1981) exhibited a significant impact on some of the dependent measures. As shown in Table IV.5, the AC-CE dimension correlated significantly with objective learning and satisfaction. The 2x2x2 analyses of variance also indicated that the concrete/abstract dimension exerted a statistically significant influence on the measure of participant satisfaction. The results of these analyses were presented in Table IV.15.

That the concrete/abstract dimension exerted a statistically significant influence on the measure of participant satisfaction might indicate either the importance of the match of the subject matter to the learners learning style, or the fact that abstract learners are simply react more favorably to being placed in learning situations. The need to assess the match of the material with the learners style is suggested since neither the training type nor the interaction of training type and learning style had a significant impact on satisfaction. Besides chance variation, one explanation to account for these differences in participant satisfaction would be the match between the content of the

training program and the participants individual learning style. In this instance, perhaps the abstract conceptualization style learners were more satisfied in extracting the theory and principles underlying the "selection" content, and applying it to their own situation was more appreciated by these learners than it was by the concrete-experience style learners. These results emerged from the data which combined training methods, (as shown in Table IV.5), and there was no significant interaction effect of training type and learning style on satisfaction. This implies that either the content of the program, or the exposure to any sort of learning situation, regardless of content or training type, accounted for the differences in the satisfaction levels.

Possible implications of this finding, if the variation in satisfaction is attributable to the variation in the AC-CE variable, is that where previous attempts at altering (improving) participant's reported satisfaction were focused on the techniques used, an alternate consideration might be the material, or the content of the educational program itself. If the content causes significant variations in reported satisfaction because of the match with the participant's learning style, then comparisons of trainers or training styles would need to be compared only while holding program content constant.

Also, if it can be determined that the difference in satisfaction ratings are attributable to learning style, regardless of the content or training style, then satisfaction measures in the future will have to be interpreted in light of individual learning style differences. If, by chance, a participant group is predominately made up of abstract learners, then the higher

ratings might mistakenly be attributed to the training style used or to the trainers abilities. Whether it is true that abstract learners consistently rate higher, or that content matches account for the difference, knowledge of the make-up of the group might aid in improving the accuracy of interpreting satisfaction measures.

The relationships among the dependent variables also deserves attention and comment. It is interesting to note the intercorrelations among objective learning, self-reported learning, and satisfaction, as listed in Table IV.5. While satisfaction and self-reported learning correlated high and positive (r=.69, $p<.001$) objective learning scores did not have positive correlations with either self-reported learning or satisfaction. The first relationship seems easy to understand and straightforward, that individuals who felt that they learned more reported more satisfaction, and those that reported less learning reported less satisfaction. The fact that these measures were on the same form, and subject to influences such as proximity error and halo effects probably also had something to do with the high positive correlation.

The other two relationships however, were not expected. There was, overall, no positive correlation between the participants objective learning score, and the satisfaction that they reported. Similarly, there was no positive relationship between objective learning and self-reported learning.

If, in fact, there is no relationship between what an individual actually learns as measured by an objective test, and

his or her self-report of what was learned, then serious questions are raised as to the accuracy of self-report test methods. Furthermore, as shown in Table IV.6, there was actually a statistically significant negative correlation between objective learning and self-reported learning (r= -.22, p < .05) in the andragogy training sessions. If these results are indicative of a trend in adult education, then the implications can be quite powerful. Malcolm Knowles (1980) states that adult learners are able to assess their own educational needs prior to training, and after training, can accurately assess and report, without formal testing, the amount of information that that they've learned. These self-grading systems which are suggested in the practice of andragogy, (Knowles, 1970, 1978, and 1980) need to be further assessed. Furthermore, the lack of a positive correlation between objective learning and satisfaction raises questions as to the usefulness of the information regarding the positive satisfaction ratings which practitioners of the andragogical methods have reported in the past. The correlations reported in Table IV.5 and IV.6 indicate that sole reliance upon measures of satisfaction or self-reported learning may not lead to accurate information regarding the total effectiveness of the program, or the amount and quality of the information that was actually learned.

While it may be considered anathema to andragogical principles to "test" at the end of an andragogical educational session, such objective measures may be needed to compare the effectiveness of training methods since self-reported learning

and actual objective learning showed a negative correlation (if effectiveness is being defined as the quantity of information learned, as indicated by individuals scores on post-tests of objective learning). In suggesting this, however, an interesting paradox emerges. To announce that there will be a test at the end of the training program is contrary to the prescriptions of andragogy, and is therefore not "true" andragogy. On the other hand, to test at the end of the training program and not previously announce it to the program participants would break down the trust between the facilitator and participants, which is an important part of andragogical programs, and could later have negative consequences in both academic and industrial setting. Also, a posttest which had not been previously announced would not have the same motivational effects, or enable the participants to study and prepare, as standard pedagogical practices would. Thus, any variance in the test results between groups might be attributable to more than simply the effectiveness of the training type. While testing for the purpose of self-diagnosis would still be useful and beneficial for practitioners, to address the issue of using test scores to compare training types, a study using methods similar to the current design would have to be conducted.

The third set of analyses assessed the relationships between the dependent variables, the demographic information and the individual difference measures, by means of multiple linear regression analyses. Although not part of the formal

hypotheses, these analyses were conducted to better understand and explain the relationships among the variables.

The first variable assessed was the measure of objective learning. Exploratory analyses were conducted to determine which variables could account for the variation in the measure of objective learning. The results of the regression analysis indicated that achievement-independence, ego development score, and age (through a negative correlation) accounted for 16% (Multiple $\underline{R}$ = .40) of the variation in objective learning scores.

Two separate themes emerging from the regression analysis with objective learning as the dependent variable deserve attention. The first is the substantial positive correlations of Independent-Achievement and ego development with objective learning scores. The second is the negative correlation of age with the objective learning scores.

From the regression analysis it was found that Independent-Achievement and ego development scores were the most positively correlated predictors of objective learning scores. The regression equation was run for the entire sample regardless of which training type participants attended, since the effects of training type were found in the earlier analyses to be of little statistical or practical significance.

The fact that the greatest proportion of the variance in the objective learning measures was accounted for by the Independent-Achievement measure and the ego development measure is noteworthy for several reasons. First, high scores on the measure of Independent-Achievement according to the

Gough (1975), indicate individuals who are "mature, forceful, strong, dominant, demanding, and foresighted; as being independent, and self-reliant; and as having superior intellectual ability and judgement" (p. 11). These individuals were the participants who regardless of the type of training, learned the material and performed well on the measure of objective learning. Whether they were motivated to pay attention in the session, were foresighted and saw the implications for practical application of the material, simply paid attention and had superior intellectual ability, or were motivated to perform well on a challenge of the amount of their objective learning cannot be concluded. But it appears that the individuals who scored higher on the Independent-Achievement measure sought to learn the material and did well on the post-test.

Higher levels of ego development indicate more responsible individuals who are likely to set long-term goals, are aware of the causation of events, and have low levels of impulsivity. That this measure accounts for a significant proportion of the variance in the measure of objective learning can be explained along similar lines as the measure of Independent-Achievement. That is, these individuals may be more likely to be aware that the subject matter may have practical applications on the job, that it may be relevant for their long term plans, and that they are responsible for learning and applying the information in their groups back at their worksites.

As shown in Table IV.5, Independent-Achievement and the measure of ego development had a low inter-correlation ($\underline{r}$ = .05,

n.s.). Taken together, these two variables can provide a powerful predictor of performance on the measure of objective learning, regardless of the training type to which the individuals were exposed. This point regarding these two variables is relevant to the work of the proponents of andragogy. The point was made in the earlier discussion that individuals who were likely to volunteer for adult learning situations, such as continuing education programs in colleges, were the types who would probably have higher than average Independent-Achievement and ego development scores than the general population. Furthermore, andragogical procedures were derived from these groups, and the successful implementations of andragogy were reported based primarily on these groups. While the present study was not able to assess the accuracy of the assertions regarding the psychological makeup of those individuals who were likely to volunteer for adult learning programs, it does support the contention that individuals characterized as high in Independent-Achievement and ego development might do well across different learning situations. The implications of this point, both for practitioners and adult education theorists, will be further addressed below.

The second noteworthy point regarding the regression analysis of the measure of objective learning is the relationship between the participant's age and learning score. Interestingly, there was a negative correlation between the age of the participants and their scores, indicating that with increasing age

test scores were lower, and for the lower ages test scores were higher.

One of the points made in the earlier discussion of andragogy and pedagogy, was the belief that there was an over-reliance on the age variable as the key determinant of training type. It was even noted that the proponents of andragogy had retreated from their earlier perspective that age was the main focus of whether andragogy or pedagogy methods should be used. The current results, however, again raise the issue of the effects of age on learning, but from a different perspective. In the current study, it was found that when the data were combined across training types, as participants ages increased, their test scores decreased. In reviewing Table IV.5, the results indicated that there was a significant negative relationship between age and objective learning scores ($\underline{r} = -.28$, $p < .001$). Furthermore, as shown in Table IV.6, the negative correlation between age and performance on the measure of objective learning was particularly extreme for individuals exposed to the andragogical type of training ($\underline{r} = -.48$, $p < .001$). Such test scores might again raise questions as to the relationship between participants age and andragogical training practices, and whether there are ability or motivational influences causing the low performance. As shown in Table IV.5, the correlation of age with Achievement-Independence was statistically significant ($r= .-23$, $p < .001$), suggesting decreasing motivation levels may exert some influence on the test performance for the more senior age groups.

There are many possible explanations as to what influence age might have on the measure of objective learning, but it is most likely that the influence is due to the variation in Achievement-independent. The older participants may simply be less motivated to learn and perform well in class and on a test. It is not difficult to conceive of the workers with more tenure at this large, government owned and operated utility organization as being reluctant to put forth the highest possible levels of effort in a training program. A measure of organizational tenure would help to clarify the relative influences of age and tenure. Noe's (1986) concepts regarding motivation to learn or motivation to transfer are relevant in this sense. Both might decrease as the participants careers peak or begin to decline. To exacerbate the situation, these individuals might also have had a low motivation to learn the particular topic upon which they were being tested. The session consisted of selection, interviewing, and EEO related matters, topics which a group consisting primarily of older, white, southern males might feel less motivated to learn and retain. Whether there is a generally low level of motivation to perform well which pervades the entire work life of these individuals, a general malaise which increases as ones tenure increases, or whether the lower scores on objective learning were due to the topic of the training program, there appears to be ample reason to suspect motivation influences over ability factors when evaluating the negative correlation of age and test scores. Again, the practical and theoretical implications of these results regarding the link

between motivation levels and performance on the test of objective learning will be addressed below.

A second multiple linear regression analysis was conducted to assess the impact that the demographic variables and the individual difference measures had on the measure of self-reported learning. This analysis was conducted to better understand and explain the relationships among the variables, particularly since there was a negative relationship between self-reported learning and objective learning scores. The following relationships were discovered with self-reported learning as the dependent variable: achievement-conformity and ego development scores correlated positively with self-reported learning, while achievement-independent and education level correlated negatively with self-reported learning. In decreasing order of magnitude, the variables were conformity, achievement-independent, ego development, education. The results of this analysis appear in Table IV.18.

The variable that accounted for the most variance in the self-reported learning variable was achievement-conformity. Gough (1957) reports high scores on this dimension of the CPI indicate individuals who are capable, cooperative, organized, responsible, stable, and sincere. The dimension is used to "...identify those factors of interest and motivation which facilitate achievement in any setting where conformance is a positive behavior" (p. 11). In the training setting such as the one used for this study, achievement through conformance is clearly a valued behavior, and cooperation, stability, and sincerity might be among the traits that lead a participant to

claim that they learned a great amount of information in the training program. Conforming behaviors and attitudes might account for much of the high levels of learning which are reported after training programs or educational experiences. These individuals might simply be conforming to the expectations which are put upon them by the trainers, educators, or researchers. Conversely, the individuals high on the Achievement-independence scale, who are also motivated to achieve, are less likely to conform, be compliant, or claim to meet the expectations of others. These individuals set and work to meet their own achievement objectives.

The negative relationship between the measure of Achievement-independence and self-reported learning can be explained through the exploration of the dimension itself. Low scores on the Achievement-independent dimension (correlating with high scores on self-reported learning) indicate an individual who is inhibited, cautious, dull, and wary, submissive and compliant before authority, and lacking in self-insight. The cautiousness, compliance, and lack of insight taken together might suggest an individual who would find it best to report that they did indeed benefit from the training opportunity which was afforded them. The individuals who scored high on Achievement-independence are described as foresighted, self-reliant individuals who demonstrate superior intellectual ability and judgement. These individuals reported lower levels of learning. Based on the description of the dimension, it would follow that these participants would be less likely to simply

comply with stated or unstated expectations, and less likely to claim that they learned more than they actually did.

The negative correlation of Achievement-independence with self-reported learning can also be explained. Since Achievement-independence uniquely accounts for a significant proportion of the variance in the objective learning scores (through a positive correlation), and self-reported learning and objective learning scores are negatively correlated, the negative correlation of Achievement-independence with self-reported learning is not unexpected.

Higher levels of ego development indicate more responsible individuals who are aware of the causation of events, and have low levels of impulsivity. Scores on the measure of ego development correlated positively in the regression analysis with the measure of objective learning, and had a low non-significant correlation with the measure of Achievement-independence. Where Achievement-independence is related in a negative direction with self-reported learning, the measure of ego development correlated positively. In the earlier discussion, it was stated that the measure of ego development assesses a complex construct, or concept. In a simple sense, it measures the individuals move to maturity; from impulsive, exploitive, dependent, self-interested behaviors, in which individuals externalize blame, through becoming aware of ones self, and surroundings, to a respect for all individuals, a development of personal achievement motivations, and a quest for self-fulfillment. While a separate discussion on self-theory could be

informative, it is sufficient here to address the issues of impulsiveness and externalization of blame at the lower levels, and the positive correlation of the ego development scores with Achievement-conformance in discussing the high end of the scale.

Participants low in ego development would be those who were likely to impulsively report learning less, because it was the fault of the trainer, the training, the organization, or any other cause other than their own effort. At the higher end of the scale, it is important to note the positive correlation of the ego development scores with Achievement-conformance. Loevinger (1976) discusses the individuals' movement towards developing a unique and self-directed indentity. Yet, the current research indicated only a movement from impulsive towards conforming behaviors. The similarity with the measure of Achievement-conformance is illustrated by the positive correlation, and the explanation of the role of ego development in the regression of self-reported learning would be the same as that for Achievement-conformance. That is, the higher self-reported learning scores were reported by individuals described as capable, cooperative, responsible, stable, and sincere, and especially compliant in those settings where conformance is a positive behavior.

Finally, in this regression analysis of self-reported learning, education level had a negative correlation. It is possible that individuals with more experience in educational settings felt that they had learned less in this particular situation when compared

to other learning situations to which they had been exposed. A single training module may be less impressive to a person with advanced educational and training experience than to a person who had not attended school beyond high school. It is also possible that the more educated persons interpreted the self-reported learning scale as a normative measure, and underestimated their individual performance in relation to the performance of others.

The final regression analysis evaluated which variables accounted for significant amounts of the variance in satisfaction scores. The Achievement-conformity variable was the only variable to uniquely account for a statistically significant portion of the variance.

The explanation of the influence of Achievement-conformity on satisfaction scores is similar to that offered regarding the influence of Achievement-conformity and ego development on self-reported learning. The dimension measures conforming behavior, and high scores indicate individuals who are among other things, cooperative, responsible, stable, and sincere. The dimension is used to "...identify those factors of interest and motivation which facilitate achievement in any setting where conformance is a positive behavior" (Gough, 1957, p.11) The participants in this study who scored high on this dimension might have chosen to conform, to rate as high their level of satisfaction with the training program, to comply and accept the implicit standards of others.

The regression analyses demonstrated the direct effects of the individual difference and demographic variables on the three outcome measures of self-reported learning, satisfaction, and objective learning. Although not originally included in the hypotheses of the study, these individual difference and demographic variables proved to have a greater direct influence than the variables which were expected to have an impact, that is, learning styles and training types. In the three regression analyses, eight variables were detected as accounting for significant portions of the variance in the three dependent variables. Of those eight independent variables, six were personality constructs (Achievement-Independent twice, Achievement-Conformance twice, and ego development twice), and two were demographic variables (education level and age). After the effects of these variables, learning style and training type could account for no significant amount of the variance in the dependent variables in the regression analysis. The findings that the primary influences on the outcome variables were personality constructs (achievement motivation levels and ego development levels) suggests that the nature and makeup of the individual participant in the training program are important variables to consider, and these considerations could have important practical implications for the choice of training styles. The practical and theoretical implications of the results are discussed below, after the limitations of the study and the directions for future research are presented.

2. Limitations of the Study

The limitations of this study can be divided into two groups. The first are those which were related to the measures used, and the second are those which dealt with the execution of the research.

One potential limitation of the study is the relatively low level of trust which could be put in the primary dependent variable, the measure of objective learning. The measure was hastily designed due to organizational pressures to begin the research, and the low alpha and high standard deviation resulted in a measure with a relatively high standard error of measurement. With research of this sort, where the learning score is the main method of evaluation, future research should devote more time and effort to the development of a reliable post-test measure.

Additional insights might have been gained by treating age as the continuous variable that it is, versus classifying ages into ranges. While some valid inferences could still be drawn, the analysis of the data might have been more telling with continuous ages. This is particularly true given the interesting effects which were noted between age and the achievement-independent scale. Organizational directives regarding this research, however, prohibited the gathering of data in any other form.

One operational limitation of this research is also a possible direction for future research. There was an approximately 6

hour time delay between the time the information was covered, and the time the test of objective learning was conducted. Some length of time had to be decided upon, whether it was immediately after the session, six hours after, the next day or the next month. But what effect the time delay had on the dependent variable will remain unknown. Whether the relationships which were detected as statistically significant in the regression analyses would remain constant over time cannot be determined, since the effects of memory decay may effect the different groups differently. Also, what effect the different training styles might have on actual behavioral transfer were not assessed. This limitation might be another topic for future research.

There were rumors of impending layoffs at the organization where the research was conducted, and these rumors were eventually proven to be true. If these rumors adversely or favorably impacted different groups, then the results may not be generalizable to other groups or organizations.

The theoretical and practical implications of the research were somewhat limited by the fact that a pretest was not given. Such a measure might have given indications of the participants' competency levels and knowledge of the subject before the commencement of training. Why this information would have been valuable will be discussed below.

Similarly, a pre-test would have been more in line with the basic prescriptions of andragogical practice. This research may not have been a true rendering of the practices of andragogy

since a pre-assessment was not given, since goals were not mutually set, and since there was a definite agenda of topics and concepts that had to be addressed. The training types did differ in the extent to which they incorporated discussion and participation, and therefore were at different points along the andragogy-pedagogy continuum, but future research might make greater efforts to make the sessions truer to the respective models of andragogy and pedagogy.

A final factor which could not be controlled for was the likability, credibility, or ability of the trainers. The effects of training type might easily be overcome by the trainers ability to make a favorable impression with the group. An individual trainer might be more impressive and entertaining in using a pedagogical delivery style, and therefore very effective, than another individual using an andragogical style who is not perceived as likable or credible. It appears that more factors than training type need to be controlled to assess the complex area of human learning.

3. Directions for Future Research

The results of the data analysis, as well as some of the limitations of the study provide directions for future research. The role and impact of the personality constructs (both achievement measures from the CPI, and the measure of ego development), need to be further assessed in relation to the outcomes of training programs, both in terms of the amount of information learned, and the extent to which behavioral transfer

takes place. Relatedly, the effects of age and education level also need to be further investigated, to determine whether these variables continue to account for significant proportions of the variance in outcome measures. If objective learning scores, satisfaction levels, and self-reported learning are influenced by personality constructs, then the relationships among these variables need to be kept in mind when assessing the effectiveness of a program or trainer. Research of this sort might clarify the extent to which program effectiveness is a characteristic of the program, or an outcome caused by the characteristics of the participants.

The relationships among the outcome measures need to be further assessed. In the current research, satisfaction and self-reported learning showed positive correlations with one another, but both correlated in a negative direction with the measure of objective learning (a statistically significant negative correlation within the andragogy condition). If data gathered from adult learners continue to show a negative or null relation between self-reported learning and actual objective measures of learning, then the former methods would appear to be unacceptable in demonstrating the effectiveness of various programs. Also, if objective learning scores and satisfaction scores are not correlated in a positive direction, then the common practice of relying solely upon participant reaction forms as training program feedback would need to be supplemented with other measures, or the limitations of such practices would need to be

clearly understood by practitioners. Additional implications of these negative intercorrelations will be discussed below.

Some of the limitations which were discussed above also provide directions, or at least controls to keep in mind, while conducting related research in the future. The perceived credibility and likability of the trainers is a variable that needs to be controlled. An alternative design for this study might have been to have individual trainers using both andragogical and pedagogical training styles with different groups. This would have reduced the effects that were due strictly to the trainers interaction style (i.e., likability, credibility, training ability).

The effects of the time delay between the educational session and the testing session needs to be assessed. While research on the effects of memory decay has a long history in psychology, beginning perhaps with Ebbinghaus (1885), continued through the work of Jenkins and Dallenbach (1924), and continuing today with the efforts of many cognitive psychologists. Such research results needs to be linked with training practices in order to draw dependable conclusions regarding the differential effects of decay. Since it is possible that memory decay affected the different participants differently, these factors would need to be kept in mind when drawing conclusions regarding the evaluation of the effectiveness of training programs.

Future research needs to assess whether individuals who volunteer for adult learning programs (such as continuing adult learning programs in colleges), score higher on the various measures of individual differences used here, especially the

Achievement-Independent scale of the CPI and the measure of ego development. This would provide additional insights into the issue of whether the prescriptions of andragogy are based on a population that is predisposed to learn more and achieve higher scores on tests of objective learning, regardless of the teaching or training method used. It might also caution practitioners against the blanket application of practices derived from a non-representative subset of the population to all potential learners in applied training settings.

A final direction for future research follows from the above research regarding achievement motivation levels. Future research might be directed towards assessing the extent to which levels of achievement motivation, along with the participants levels of competence, skill, experience and knowledge in the subject matter can be used to determine, or at least suggest, which style of training might be the most beneficial for program participants. The theoretical and practical implications of such a model is discussed below.

4. Theoretical Implications

While little in the way of theoretical implications can be gained from the manipulations performed with the training types and the learning styles, the personality measures raised several potentially important implications for training related issues. The primary theoretical implications of this study involve the individual difference measures and the relationships

among these variables, as well the potential for using such measures to build a heuristic model to determine the appropriate training style for use in different training situations.

The participants chronological age was demonstrated to have an impact on the measure of objective learning. There was also an unexpected high inverse correlation between age and the Achievement-Independent scores. The Manual for the California Psychological Inventory does not provide information regarding the effects of age on the Achievement-Independent scale. Whether the relationship detected between these variables in this study is attributed to a natural decrease in ones achievement drive as age increases, or due to the effects of a long tenure at a large, bureaucratic organization, the outcome is noteworthy and merits future research attention. While these results support the developmental psychologists' perspective that there exists a heightened concern for individual achievement in early adulthood and a decrease in achievement motivation as an individual ages, such an age dependent decrease in achievement scores as measured by Achievement-Independent scale has not been documented.

The effect that Achievement-Independent scores had on the objective learning scores is of theoretical importance for another reason. The point had been made earlier in this discussion that the theory and prescriptions of andragogy had been based on observation made in voluntary adult learning programs, and that the individuals who attend such programs are likely to score high on the Achievement-Independent scale. If it is indeed the case that the basic principles of andragogy

were derived from individuals who might have higher Achievement-Independent scores, then it may be the case that the theory and practices of andragogy may be appropriate only for a select group of learners.

An alternative interpretation is that, since the individuals scoring high on the Achievement-Independent scale did well in both training types, these individuals might do well in almost any learning situation. Therefore, the andragogical principles which were employed in those sessions were inappropriately assumed to be the cause of the success. In practice, it may be inappropriate to apply the andragogical methods to adult learners who do not volunteer for the educational sessions since they may not possess the same personality makeup as those from whom the theory and practices were derived. It's important to note this fact since it is often the case in business training settings that training is compulsory, and many of the program participants might not have attended if the program was not mandatory.

A final theoretical implication of these results is that they suggest that with further research, it may be possible to create a model for assistance in the determination of when, and for whom, the different styles of training might best be used. Just as effective managers might be considered "versatile and inconsistent", (Skinner and Sasser, 1983) so too, might an effective instructor or facilitator be versatile and inconsistent with regard to his or her training or teaching style, with the characteristics of the individual learner determining the style of

educational leadership employed. Using this situation dependent model, similarities can be drawn between the model of Situational Leadership (Hersey and Blanchard, 1969) and a proposed model for the determination of appropriate training styles.

Situational leadership rests upon the assumption that the characteristics of the person or persons being led (or managed) determines the most appropriate style of leadership (or management). The determining characteristics of the followers, which in turn indicate the appropriate leadership style are the followers motivation level and competence level. There are, according to this model, two leadership behavioral dimensions which need to be decided upon, based on the motivation and competence levels of the followers. The two leadership behavior dimensions are "directiveness" and "supportiveness". Directiveness and supportiveness are similar to Blake and Moutons (1964) "concern for production" and "concern for people" and Stogdill and Coons (1957) concepts of "initiating structure" and "consideration". Directiveness is defined as the extent to which a leader creates a structure, sets goals and objectives, plans the work of the followers, clarifies roles, determines methods of evaluation, and guides and controls the work of others. Supportiveness is defined as the extent to which a leader listens to the problems of the followers, praises the followers for task accomplishment, asks for suggestions and input on task accomplishment, encourages and reassures the followers, communicates information, discloses information

about the self, and facilitates follower problem solving and decision making.

The two dimensions of leader behavior (directiveness and supportiveness), in high-low combinations, result in the four primary styles of situational leadership, which are directing, coaching, supporting, and delegating. While such a model might simplify the concept of leadership and the leadership process, it does provide a useful comparative heuristic for the field of training and development. Malcolm Knowles (1984) stresses the importance of respecting participants competence, knowledge, and experience, and in the current study the critical role of motivation has been discussed. These observations suggest that a model for training or education, similar to the model of Situational Leadership, might be constructed and evaluated. At the initial stages, a directive, pedagogical approach is implied for the trainer. As the participants motivation and competence levels increase, the movement is towards a more andragogical approach to training. The idea of a leader behavior continuum is reminiscent of Knowles (1984) perspective that andragogical and pedagogical practices are the ends on a continuum, and not separate and completely dichotomous practices.

An unpublished study of the application of the principles of Situational Leadership to the educational setting was conducted by Hersey, Angelini, and Caracushansky in Brazil. While the report of their research, sited in Hersey and Blanchard (1982), lacked details as to the ages of the participants or the control over the andragogical and pedagogical training techniques, it did

conclude that the group who were exposed to the Situational Leadership approach to training "showed not only higher performance on content exams but were also observed to have a higher level of enthusiasm, morale, and motivation as well as less tardiness and absenteeism" (p.165-166).

Perhaps the development and refinement of such a model for the application of training techniques, with its basis in the participants commitment level (as assessed by the achievement-independent scale of the CPI [1957] and Loevinger's Measure of Ego Development [1976]) and competencies (education, knowledge of the subject, and relevant life experiences, as Knowles [1984] emphasizes), can be used to more accurately determine when the various styles of training would best be used. Such a model might be more effective than simply relying upon the participants chronological age to determine the best training type, and would have great implications for the practice of adult training, education, and development.

5. Practical Implications

In the past, proponents of andragogy would contend that all adult learners benefit more from participative, collaborative types of educational programs than from pedagogical types of programs. The objectives of this study were to assess whether certain individual personality differences could account for differences in preferred learning styles, and to examine whether

preferred learning styles can account for the effectiveness of, and the reactions to, different types of training methods. The practical implications which can be gathered after conducting the study involve training and educational programs, but only indirectly address the hypotheses which were initially the focus of the study.

The findings that the primary influences on the outcome variables were personality constructs (achievement motivation levels and ego development levels--similar in nature to Noe's [1986] "motivation to transfer" concept) suggests that the nature and characteristics of the individual in the training program could have important practical implications on how the program should be conducted. Noe's (1986) terms also suggest caution in attempting to generalize findings from a group of individuals characterized by a high motivation to learn to other individuals who may not be characterized as having a high motivation to learn. The current study suggested that individuals characterized as highly motivated performed well in both training situations. Similarly, it was suggested that this might be the group of individuals who would be likely to voluntarily attend continuing education programs, and do well within the programs, regardless of how they were taught. The persons who score high (or would score high, if assessed) on the CPI's (1957) independent-achievement scale, are therefore not the challenging group for trainers or teachers. The challenge to practitioners is the group of individuals who are characterized as having low levels of motivation and/or competence in the subject matter. Assistance in the determination of how to train

these individuals might come from the refinement of the model presented above. By determining the participants' levels of motivation to learn and their competence level with the subject matter, assistance could be provided in determining how to train the various participants.

The model of training-leader behavior which might be developed is similar to the model of Situational Leadership presented by Hersey and Blanchard (1969, 1982). This is suggested because, in the current study, participants levels of independent-achievement motivation had great effects on the extent to which they acquired and retained the information relayed in the training program. The practical implications of the development and refinement of a model of trainer behavior would mean that practitioners would have a definitive, heuristic model to assist in the determination of where, when, and with whom they can rely upon the different training styles. A model would move the field of education and training away from the broad application of training prescriptions based on participants age, towards specific and measurable characteristics of the individuals, regardless of their age. Also, different styles of training could be employed within classes or courses for different participants, based on their own unique experience history and needs. It suggests, too, that the effective trainers, teachers, facilitators will be those who are versatile and flexible, and need to go beyond the constant use of a particular style with which they are most comfortable Since different styles of training are likely to be effective with different individuals, it

likely that the most effective program or course leaders will be those who are skilled in the different training styles and adaptable to the needs of the participants.

What all this suggests is that motivation levels and competency levels, and not the participants age, are likely to be the critical factors to consider when prescribing training styles and techniques. If the model, such as the one discussed above can be made clear and explicit, it would prove to be an invaluable aid in the determination of which types of training styles to use with program participants.

A final matter of practical importance is the determination in this study that, overall, there was not a positive correlation between self-reported learning and the participants performance on a test of objective learning. Practitioners are faced with the question of determining how to assess the effectiveness of andragogical training or educational programs. Perhaps it is true, as the proponents of andragogy claim, that standard testing procedures are not helpful, and even can be aversive to the more mature adult learners. But a dilemma remains: to provide a test of objective learning at the end of an andragogical training program is to act counter to the prescriptions of andragogy, and yet to rely upon self-reported learning might provide little or no accurate information regarding the effectiveness of the program. To announce that there will be a "test" at the end of the andragogically based program is to change the course or program from one with a pure andragogical design, towards something back towards the

pedagogical end of the educational practices continuum. Since "true" andragogy does not allow for post-testing, the effectiveness of "true" andragogy may never be accurately assessed. Perhaps theorists and practioners, working together, can develop and refine a model such as the one presented and discussed above, and can evaluate the effectiveness of each of the appropriate applications of all the other training styles along the andragogy-pedagogy continuum--and the effectiveness of "true" andragogy can then be inferred. Such an empirical evaluation of the pedagogy-andragogy continuum will move the field of education forward, and will advance the topic of adult education and andragogy from one based on observation, speculation and broad prescriptions, towards a respected, empirically validated science.

6. Conclusions

As the rate of changes and technological advances in the world continue to increase, the need for continuous adult education becomes imperative. So, too, does the need for an understanding of the education and training of adults.

Although none of the 16 hypotheses which were assessed in this research were statistically significant, insights have been gained into the issues related to andragogy and adult learning theory. Among the notable findings was the negative correlation of chronological age and objective learning scores. Most

important regarding that relationship, was the correlation of age with Achievement scores, which showed that as Achievement-Independent scores dropped (as age increased) so too, did scores on objective learning. The important role of Achievement-Independent scores indicated that motivational levels should be among the factors that trainers of adults consider when determining how to conduct a course or training program. Attention directed towards achievement motivation and experience levels of the learners might aid in the perception of andragogy and pedagogy being on a contiuum of training techniques, versus being opposing theories and practices. The research resulted in a model, based on the characteristics of the learner, which future researchers and practitioners might use as a heuristic to facilitate an understanding of the relationship of pedagogy and andragogy, as well as to facilitate an understanding of the appropriate applications of the different training types.

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APPENDIX:

MEASURES USED IN THE STUDY

Locus of Control Scale

Participant #_____

Directions: Please read each pair of sentences. Then circle the number and letter preceeding the one statement from each pair that you agree with the most.

1a. Many of the unhappy things in people's lives are partly due to bad luck.
1b. People's misfortunes result from the mistakes they make.

2a. One of the major reasons we have wars is because people don't take enough interest in politics.
2b. There will always be wars, no matter how hard people try to prevent them.

3a. In the long run, people will get the respect they deserve in this world.
3b. Unfortunately, an individuals worth often passes unrecognized no matter how hard he tries.

4a. The idea that teachers are unfair to students is nonsense.
4b. Most students don't recognize the extent to which their grades are influenced by accidental happenings.

5a. Without the right breaks, one cannot be an effective leader.
5b. Capable people who fail to become leaders have not taken advantage of their opportunities.

6a. No matter how hard you try some people just don't like you.
6b. People who can't get others to like them don't understand how to get along with others.

7a. I have often found that what is going to happen will happen.
7b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

8a. In the case of a well prepared student, there is rarely if ever such a thing as an unfair test.
8b. Many times exam questions tend to be so unrelated to course work that studying is really useless.

9a. Becoming a success is really a matter of hard work, luck has little or nothing to do with it.
9b. Getting a good job depends mainly on being in the right place at the right time.

10a. The average citizen can have an influence on government decisions.
10b. The world is run by a few people in power, and there is not much the little guy can do about it.

11a. When I make plans, I am almost certain that I can make them work.
11b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

12a. In my case getting what I want has little or nothing to do with luck.
12b. Many times we might just as well decide what to do by flipping a coin.

13a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
13b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.

14a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.
14b. By taking an active part in political and social affairs the people can control world events.

15a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
15b. There really is no such thing as "luck".

16a. It is hard to tell whether or not a person really likes you.
16b. How many friends you have depends upon how nice a person you are.

17a. In the long run the bad things that happen to us are balanced by the good ones.
17b. Most misfotunes are the result of lack of ability, ignorance, laziness, or all three.

18a. With enough effort we can wipe out political corruption.
18b. It is difficult for people to have much control over the things politicians do in office.

19a. Sometimes I can't understand how teachers arrive at the grades they give.
19b. There is a direct connection between how hard I study and the grades I get.

20a. Many times I feel that I have little influence over the things that happen to me.
20b. It is impossible for me to believe that chance or luck plays an important role in my life.

21a. People are lonely because they don't try to be friendly.
21b. There's not much use in trying too hard to please people, if they like you, they like you.

22a. What happens to me is my own doing.
22b. Sometimes I feel that I don't have enough control over the direction my life is taking.

23a. Most of the time I can't understand why politicians behave the way they do.
23b. In the long run the people are responsible for bad government on a national as well as on a local level.

California Psychological Inventory

Participant # _____

The following pages provide a series of statements. Read each one, decide how you feel about it, and then mark your answer. If you agree with the statement, or feel that it is true about you, circle the "T". If you disagree with a statement, or feel it is not true about you, circle the "F".

Achievement-Conformance

01. I have a very strong desire to be a success in the world.	T	F	
02. I liked "Alice in Wonderland" by Lewis Carroll.	T	F	
03. I usually go to the movies more than once a week.	T	F	
04. I have had very peculiar and strange experiences.	T	F	
05. I am often said to be hotheaded.	T	F	
06. When I was going to school I played hooky quite often.	T	F	
07. I think I would like the work of a school teacher.	T	F	
08. When someone does me wrong I feel I should pay him back if I can, just for the principle of the thing.	T	F	
09. Planning one's activities in advance is very likely to take the fun out of life.	T	F	
10. I was a slow learner in school.	T	F	
11. There is something wrong with a person who can't take orders without getting angry or resentful.	T	F	
12. I wake up fresh and rested most mornings.	T	F	
13. I have a tendency to give up easily when I meet difficult problems.	T	F	
14. I certainly feel useless at times.	T	F	
15. I have the wanderlust and am never happy unless I am roaming or traveling about.	T	F	
16. I am sometimes cross and grouchy without any good reason.	T	F	
17. My parents have often disapproved of my friends.	T	F	
18. My way of doing things is apt to be misunderstood by others.	T	F	
19. I have had blank spells in which my activities were interrupted and I did not know what was going on around me.	T	F	
20. I like to keep people guessing what I'm going to do next.	T	F	
21. If given the chance I would make a good leader of people.	T	F	
22. In school I was sometimes sent to the principle for cutting up.	T	F	
23. I like to read about history.	T	F	
24. I am so touchy on some subjects that I can't talk about them.	T	F	
25. I like to talk before groups of people.	T	F	
26. I am often bothered by useless thoughts which keep running through my mind.	T	F	
27. I like to plan out my activities in advance.	T	F	
28. I must admit I find it very hard to work under strict rules and regulations.	T	F	
29. I like large, noisy parties.	T	F	
30. I always try to do at least a little better than what is expected of me.	T	F	
31. I would be very unhappy if I was not successful at something I had seriously started to do.	T	F	
32. I often lose my temper.	T	F	
33. My parents were always very strict and stern with me.	T	F	
34. I often get disgusted with myself.	T	F	
35. Society owes a lot more to the businessman and the manufacturer than it does to the artist and the professor.	T	F	
36. I think I would like to belong to a motorcycle club.	T	F	
37. I used to like it very much when one of my papers was read to the class in school.	T	F	
38. I don't seem to care what happens to me.	T	F	

Achievement-Independence

39. I looked up to my father as an ideal man.	T	F	
40. Our thinking would be a lot better off if we would just forget about words like -"probably", "approximately", and "perhaps".	T	F	
41. I liked "Alice in Wonderland" by Lewis Carroll.	T	F	
42. I have had very peculiar and strange experiences.	T	F	
43. I have very few fears compared to my friends.	T	F	
44. For most questions there is just one right answer, once a person is able to get all the facts.	T	F	
45. I seem about as smart and capable as most others around me.	T	F	
46. I usually take an active part in the entertainment at parties.	T	F	
47. The trouble with many people is that they don't take things seriously enough.	T	F	
48. It is always a good thing to be frank.	T	F	
49. It is annoying to listen to a lecturer who cannot seem to make up his mind as to what he really believes.	T	F	
50. I don't blame anyone for trying to grab all he can in this world.	T	F	
51. I was a slow learner in school.	T	F	
52. I like poetry.	T	F	
53. Sometimes without any reason or even when things are going wrong I feel excitedly happy,"on top of the world."	T	F	
54. It is alright to get around the law if you don't actually break it.	T	F	
55. Parents are much too easy on their children nowadays.	T	F	
56. I have a tendency to give up easily when I meet difficult problems.	T	F	
57. Teachers often expect too much work from the students.	T	F	
58. I think I would like to fight in a boxing match sometime.	T	F	
59. I like to plan a home study schedule and then follow it.	T	F	
60. I have often found people jealous of my good ideas, because they had not thought of them first.	T	F	
61. People pretend to care more about each other than they really do.	T	F	
62. The future is too uncertain for a person to make serious plans.	T	F	
63. The man who provides temptation by leaving valuable property unprotected is about as much to blame for its theft as the one who steals it.	T	F	
64. I sometimes feel like I am a burden to others.	T	F	
65. Only a fool would try to change our American way of life.	T	F	
66. Lawbreakers are almost always caught and punished.	T	F	
67. I dread the thought of an earthquake.	T	F	
68. I often lose my temper.	T	F	
69. I am bothered by people outside, on streetcars, in stores, etc., watching me.	T	F	
70. I feel that I have often been punished without cause.	T	F	

Ego Development-Female

PARTICIPANT # _____ **F**

DIRECTIONS: Please complete the following sentences. Notice that there are three pages, so make sure that you provide endings for each of the sentences.

01. Raising a family

02. A girl has a right to

03. When they avoided me

04. If my mother

05. Being with other people

06. The thing I like about myself

07. My mother and I

08. What gets me into trouble

09. Education

10. When people are helpless

11. Women are lucky because

12. My father

13. A pregnant woman

14. When my mother spanked me, I

15. A wife should

16. I feel sorry

17. Rules are

18. When I get mad

19. When a child will not join in group activities

20. Men are lucky because

21. When they talked about sex, I

22. At times she worried about

23. I am

24. A woman feels good when

25. My main problem is

26. My husband and I will

27. The worst thing about being a woman

28. A good mother

29. Sometimes she wished that

30. When I am with a man

31. When she thought of her mother, she

32. If I can't get what I want

33. Usually she felt that sex

34. For a woman a career is

35. My conscience bothers me if

36. A woman should always

Ego Development-Male

PARTICIPANT # _____

DIRECTIONS: Please complete the following sentences. Notice that there are three pages, so make sure that you provide endings for each of the sentences.

01. Raising a family

02. When a child will not join in group activities

03. When they avoided me

04. A man's job

05. Being with other people

06. The thing I like about myself is

07. If my mother

08. Crime and delinquency could be halted if

09. When I am with a woman

10. Education

11. When people are helpless

12. Women are lucky because

13. What gets men into trouble is

14. A good father

15. A man feels good when

16. A wife should

17. I feel sorry

18. A man should always

19. Rules are

20. When they talked about sex, I

21. Men are lucky because

22. My father and I

23. When his wife asked him to help with the housework

24. Usually he felt that sex

25. At times he worried about

26. If I can't get what I want

27. My main problem is

28. When I am criticized

29. Sometimes he wished that

30. A husband has a right to

31. When he thought of his mother, he

32. The worst thing about being a man

33. If I had more money

34. I just can't stand people who

35. My conscience bothers me if

36. He felt proud that he

Measure of Objective Learning

PARTICIPANT NUMBER _____

Directions: Please circle the number of the correct response to each of the questions.

1. Which of the following is NOT one of the advantages of structured selections?
    1. better quality
    2. better defensibility
    3. time savings
    4. improving the candidates image of the firm

2. Which of the following is the correct order of an internal search?
    1. post vacant position announcement, write job description, identify vacancy, receive candidate list, await applications,
    2. identify vacancy, write job description, post vacant position announcement, await applications, receive candidate list.
    3. identify vacancy, post vacant position announcement, write job description, await applications.
    4. identify vacancy, await applications, post vacant position announcement, write job description.

3. Who prepares the Vacant Position Announcement?
    1. the job incumbent
    2. you, the supervisor/manager
    3. the DPO
    4. the Branch chief

4. When you've identified the persons who you'd like to interview, who should schedule the interview?
    1. the DPO
    2. you, the supervisor/manager
    3. one of your support staff
    4. the Branch chief

5. What is the correct order of the final steps in the selection process?
    1. conduct interviews, select the candidates, make a selection, extend an offer.
    2. conduct interviews, make a selection, select the candidates, extend an offer.
    3. select the candidates, conduct interviews, make a selection, extend an offer.
    4. select the candidates, make a selection, conduct interviews, extend an offer.

6. When you decide to extend an offer, who should do it?
    1. you, the supervisor/manager.
    2. the DPO.
    3. the Section head.
    4. the Branch chief.

7. In the information gathering stage of the interview, which of the following is NOT what you should be looking for?
    1. experience, education, and transferable skills.
    2. reactions to travel, overtime, etc.
    3. evidences of knowledge, skills, or abilities.
    4. employment status of spouse.

Directions: In the following section, please indicate whether the statement is true (T) or false (F) by circling the appropriate letter.

T F 08. The employment office does not routinely check applicants references

T F 09. You, as supervisor, are free to check references on your own.

T F 10. The selection interview should not be used to gather information about past job performance

T F 11. The selection interview can legally be used to confirm information that has been provided in the paperwork.

T F 12. It's usually not considered a good idea to use multiple interviewers in the selection interview.

T F 13. The following question is okay to ask during a selection interview: "How often do you tend to miss work?"

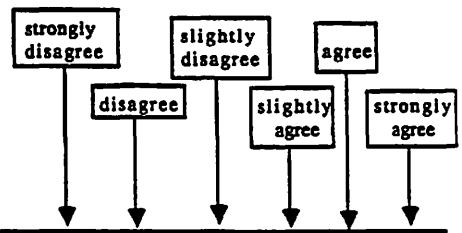
T F 14. The following question is okay to ask during a selection interview: "You don't mind Polish jokes do you?"

T F 15. The following question is okay to ask during a selection interview: "Are you on any type of medication?"

Participant Survey Form

Participant # _____ **Trainer**_____

Directions: Please carefully rate the following statements Indicate the extent to which you agree or disagree with the each sentence by circling the number corresponding to the response choice that best represents how you feel about the statement. Remember, rate only the "Selection" section of OTS.



1. The training content was related to real-life situations.	(1)	(2)	(3)	(4)	(5)	(6)
2. The topic was structured so that it was easily understandable.	(1)	(2)	(3)	(4)	(5)	(6)
3. Time spent on the topic was effectively allocated.	(1)	(2)	(3)	(4)	(5)	(6)
4. The presentation mode (i.e., lecture, group discusion, etc.) contributed to my learning.	(1)	(2)	(3)	(4)	(5)	(6)
5. The topic addressed knowledge and skills relevant to my job and/or personal needs.	(1)	(2)	(3)	(4)	(5)	(6)
6. I liked the method used to cover the content of this topic.	(1)	(2)	(3)	(4)	(5)	(6)
7. The trainer presented material in a manner that held my interest.	(1)	(2)	(3)	(4)	(5)	(6)
8. The trainer maintained control and direction of the group.	(1)	(2)	(3)	(4)	(5)	(6)
9. The trainer appeared well prepared and knowledgable.	(1)	(2)	(3)	(4)	(5)	(6)
10. The trainer stimulated me to learn.	(1)	(2)	(3)	(4)	(5)	(6)

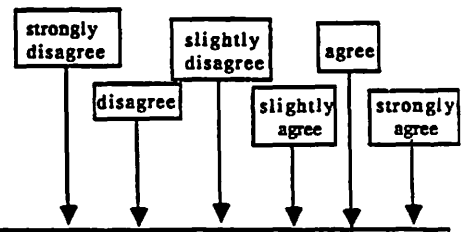
11. How would you rate the trainers performance with regard to how he/she covered the topic of Selection?

(1) poor
(2) mediocre
(3) adequate
(4) good
(5) very good
(6) excellent

12. Overall, how satisfied were you with the way the topic was covered?

(1) very dissatisfied
(2) dissatisfied
(3) slightly dissatisfied
(4) slightly satisfied
(5) satisfied
(6) very satisfied

Directions: Please carefully rate the following statements. Indicate the extent to which you agree or disagree with the each sentence by circling the number corresponding to the response choice that best represents how you feel about the statement. Remember, rate only the "Selection" section of OTS.



13. I made a lot of progress in gaining factual knowledge (i.e., terminology, methods, etc) about this topic.	(1)	(2)	(3)	(4)	(5)	(6)
14. I made a lot of progress in learning the fundamental principles and theories of this topic.	(1)	(2)	(3)	(4)	(5)	(6)
15. I feel confident that I will be able to apply the material learned in problem-solving and decisionmaking situations	(1)	(2)	(3)	(4)	(5)	(6)
16. Overall, I feel that I know a great deal more about this topic now than before this topic was covered in OTS.	(1)	(2)	(3)	(4)	(5)	(6)
17. The methods that were used are likely to result in great retention of the information.	(1)	(2)	(3)	(4)	(5)	(6)
18. I feel that I would be able to perform well on an objective test of my learning of the content of this topic.	(1)	(2)	(3)	(4)	(5)	(6)

Please circle the age range of which you are a member:

20-24 25-29 30-34 35-39 40-44 45-49 50-54 55-59 60-64 65-69

Please circle the highest level of education that you've completed:

High school College Masters Degree Doctorate

Learning-Style Inventory: Instructions

The Learning-Style Inventory describes the way you learn and how you deal with ideas and day-to-day situations in your life. Below are 12 sentences with a choice of four endings. Rank the endings for each sentence according to how well you think each one fits with how *you* would go about learning something. Try to recall some recent situations where you had to learn something new, perhaps in your job. Then, using the spaces provided, rank a "4" for the sentence ending that describes how you learn *best*, down to a "1" for the sentence ending that seems *least* like the way you would learn. Be sure to rank all the endings for each sentence unit. Please do not make ties.

Example of completed sentence set:				
0 When I learn:	4 I am happy	1 I am fast.	2 I am logical.	3 I am careful
1 When I learn	____ I like to deal with my feelings	____ I like to watch and listen	____ I like to think about ideas	____ I like to be doing things.
2 I learn best when:	____ I trust my hunches and feelings	____ I listen and watch carefully.	____ I rely on logical thinking	____ I work hard to get things done.
3 When I am learning	____ I have strong feelings and reactions.	____ I am quiet and reserved	____ I tend to reason things out	____ I am responsible about things
4 I learn by	____ feeling	____ watching.	____ thinking.	____ doing.
5 When I learn:	____ I am open to new experiences.	____ I look at all sides of issues	____ I like to analyze things, break them down into their parts.	____ I like to try things out
6 When I am learning:	____ I am an intuitive person	____ I am an observing person	____ I am a logical person.	____ I am an active person.
7 I learn best from:	____ personal relationships	____ observation.	____ rational theories	____ a chance to try out and practice
8 When I learn:	____ I feel personally involved in things.	____ I take my time before acting	____ I like ideas and theories.	____ I like to see results from my work
9 I learn best when	____ I rely on my feelings	____ I rely on my observations	____ I rely on my ideas	____ I can try things out for myself
10 When I am learning	____ I am an accepting person	____ I am a reserved person	____ I am a rational person	____ I am a responsible person
11 When I learn	____ I get involved	____ I like to observe	____ I evaluate things	____ I like to be active
12 I learn best when:	____ I am receptive and open-minded	____ I am careful	____ I analyze ideas	____ I am practical.

VITA

Rick Cartor was born and raised in Wickliffe, Ohio, where he attended Our Lady of Mount Carmel Grade School, and Lake Catholic High School. At Miami University in Oxford, Ohio, Rick received a B.A. in Psychology, then earned his Ph.D. in Industrial/Organizational Psychology at the University of Tennessee.

While in graduate school, Rick was a research assistant and later a teaching assistant. He taught both General Psychology and Industrial/Organizational Psychology. Rick worked for Martin Marrietta Energy Systems as a research associate, The Baptist Health System of East Tennessee as the Associate Director of Training and Development, and at The Tennessee Valley Authority as a Training Officer and currently as a Training Evaluation Specialist. Rick has also done a variety of management consulting work for many different types of organizations, and is an adjunct faculty member of the Management Department at Maryville College.

Rick currently lives in Knoxville with his wife Pam, and their two cats, Kitty and Squeak.